Food Manufacture

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Canned Foods.

ONE OF the objects of the New Health Society is "to teach the advantages of right food," and another is to advocate the best methods of food production. In pursuance of these objects, the New Health Society has recently issued a booklet which tells what canning has done for the community, and sets forth in most admirable fashion the many advantages of canned foods. This booklet should certainly be read by everyone concerned with this great industry and by everyone interested in dietetics. We heartily congratulate the New Health Society for having brought together a mass of scientific evidence which will perform the much needed and enormously useful function of removing the widespread misconception and uncertainty attached to canned foods.

We were really impressed by this publication of eight pages, and our representative called at the headquarters of the Society in order to obtain the latest views of Sir Arbuthnot Lane himself. These are given on another page. "The conditions introduced by modern science," says the President of the New Health Society, "are such that foodstuffs canned under them are at least as pure as, and in many cases purer than, natural foods treated with less care under ordinary trade conditions." That puts the whole truth of the matter in a nutshell, and it should dissipate, once and for all, the last shreds of suspicion and uncertainty lurking at the back of the public mind.

Canned Meats.

Note what the New Health Society has to say about the food value of canned meats! "In actual caloric and protein value most animal canned foods are superior to the fresh food as bought." Also, "The vitamins present in animal preserved food are A, B, and D, and recent researches show most conclusively that these vitamins are not destroyed at the preserving temperature, as in modern processes the contents of the tins are not subjected to oxidation by air during the heating process."

Canned Fruits.

With regard to fruits, the conclusion is reached that, "canned and bottled fruits have generally the full food value of fresh fruit," and, "properly canned fruit is a reliable source of vitamin C, gives practically all the dietetic advantages of the fresh fruit, and is superior in all respects to kitchen-cooked fruit." It has been found that, (1) Canned tomatoes are more potent in vitamin C than fresh orange juice, (2) canned apples are equal in vitamin C to the fresh fruit, (3) canned peaches are equal in vitamin C to the raw, ripe, seasonal fruit, and (4) canned strawberries are equal in vitamin C to the fresh fruit, and tests show them to have suffered no loss after one year's storage.

Canned Vegetables.

As for vegetables, when properly preserved, they retain their vitamin content intact. Canned peas are richer in vitamin than orange juice, and canned spinach is the richest food in vitamin A, with the exception of cod-liver oil; it is richer in D than butter, and equal to orange juice in vitamin C. Tinned spinach was examined after three years' storage, and found to have undergone no deterioration in vitamin content.

Food Poisoning.

The New Health Society states that the danger of disease or poisoning from the consumption of canned

fruit is negligible, and that it is certain that there are far more cases of poisoning and disease from the consumption of infected or decomposing fresh food than from the use of canned foods.

Sir William Willcox, the eminent toxicologist, has said that ptomaine poisoning from the consumption of canned foods was so rare that it could be dismissed, and the Society adds that, so far as can be ascertained, no authentic case of ptomaine poisoning from eating canned foods has ever been recorded.

As regards the possibilities of metallic poisoning, Sir William Willcox has stated recently that he had never met a case, in a very large experience, of metallic food poisoning from eating canned foods.

Advantages.

The general conclusion arrived at by the New Health Society, as set forth in this most excellent booklet, is that canning brings wholesome food within the reach of millions of people, it prevents waste, it lengthens the life of fruit crops and vegetables, it obliterates the seasons, and it adds variety to diet and gives incentive to appetite.

Also, that canned foods are safe sources of nutriment, giving the full protein, caloric, and vitaminic value of the fresh foods from which they are prepared, and may be used with every confidence to complete the daily ration where, for any reason, whether productive, economic, or for convenience, the entire use of fresh foods is impracticable.

Symposiums.

Among these editorial comments, readers will hardly have failed to note, perhaps with some surprise, the frequently recurring reference we have made to American views, research, and practice. This is not because we happen to have an uncle in that country or because we admire the screened contortions of Hollywood actresses, but rather on account of that commendable lack of reserve and reticence in the American which permits free expression of any store of knowledge he may have gained as a result of experience or meditation. These people evidently glory in gathering together for the purposes of unburdening their minds, exchanging views, and generally "talking shop." That is a good thing. It is a good thing for those that foregather and do the talking, and it is also a good thing for the editorial "we" who sit in "armchairs" and do the listening and recording. If everyone suffered from "sealed lips," we should soon run short of food for comment. The proper name for a really big tea-party, half business men and half technical men, is a symposium.

For four days in September of last year there was a symposium at Swampscott, Mass., and the text was "Chemistry and the Food Industries." We have before us forty pages of printed matter recording what was said by eminent authorities regarding the modern technical aspects of the canning, beverage, baking, cocoa and chocolate, jam and jelly, citrus products, flavouring extract, shortening, dairy, spice, breakfast-food, milling, and confectionery industries. It is all excellent material and of incalculable value to those that are in the factory and those that are about to enter therein. To the younger generation, especially, this constant airing of accumulated knowledge is of tremendous assistance; in this country so much time and energy is taken up in trying to find out what is behind those "sealed lips" that there is little left of either for the breaking of new ground. It goes even beyond this; we have had young men inquiring where they can get a basic training in, for instance, jam making or chocolate and candy making, and what books are written upon these subjects. Where are they? As we have remarked before, how can one expect to have scientific and progressive food industries if there is no adequate training ground for new recruits? More than once we have had to brush aside our native modesty and suggest that FOOD MANUFACTURE gives the helping hand.

Candy Chemistry.

Take the paper read at this symposium by H. S. Paine on "Research in the Confectionery Industry." Mr. Paine points out that chemistry applied to the candy industry has been used primarily for the purpose of analysis and control, and even then it has been restricted to certain phases of manufacture, especially to the control of dyes to obtain the desired shades. The technology of candy manufacture has been developed on a rule-of-thumb basis. For many years chemistry has assisted the candy industry indirectly by improving the quality and increasing the variety of available raw materials. But its direct and constructive application has only come recently. Herein lies the great opportunity of chemistry—the devising of new types of confections, the control over consistency and texture, the retarding of aging, and so on. This can only be achieved by active co-operation between chemist and candy maker.

Such is the state of affairs in America; nothing better and something worse can be said about its status on this side of the water. Of all modern industries it is one of the most secretive and conservative from the chemists' point of view. But that is a reason why it offers such splendid opportunities!

Candies Defined.

Mr. Paine notes that candies may be regarded as a mixture of sugars in various physical states which may serve as a matrix for fruits and nuts, this matrix being flavoured and coloured as desired. On the

whole, the consistency of confectionery is determined primarily by the character and proportion of the sugars used and the quantity of water present. In some cases, however, the water, acid, or fat content of the fruits or nuts may play a part in influencing consistency. The quantity of water depends primarily on the temperature to which the batch is cooked in its initial stage.

Fondant.

Thus, in fondant the most important factor determining consistency is the relative proportion of solid and liquid phases. This ratio, in turn, depends upon the character and proportion of sugars and the proportion of water present. The density and viscosity of the liquid phase is, of course, another factor. Fondant, by the way, is described in the chemists' language as "a plastic material consisting of a solid phase of microscopic sucrose crystals and a liquid phase which usually contains invert sugar, corn syrup solids, and sucrose, being saturated with respect to the sucrose." This is how the chemist pictures fondant in his own mind. He sees it tremendously magnified, and he can, after numbers of experiments and calculations, picture what would happen to the physical structure of the fondant under specified conditions. Since these latter may be varied indefinitely, it would take a very long time to derive this knowledge by experiment alone. Furthermore, the chemists' method gives, in time, a powerful instrument for creating new products and for detecting the causes of undesirable features in those already under production. Essentially the same methods have given us the astonishing range of metallic alloys and the endless variations in glass, glaze, and pottery products. At first sight there appears little in common between candy making and glass making or pottery manufacture, or even the preparation of alloys, yet, fundamentally, they are very similar and belong to the same department of physics and chemistry; so much so that we venture to suggest that to transfer a man of science from the ceramic laboratory to the candy factory would be a very good stroke of policy.

Invertase.

But we are drifting away from the matter in hand. Suppose one requires in chocolate-coated fondant centres a softer consistency, in other words, an increase in the proportion of liquid phase to solid phase. This may be done by adding a definite proportion of the enzyme invertase to the fondant just before the latter is cast or moulded. The invertase causes inversion of a portion of the sucrose in the liquid phase, thus increasing the proportion of invert sugar present. This increases total sugar solubility and permits a portion of the sucrose crystals in the solid phase to pass into solution. As a result, the quantity of solid phase is decreased and the quantity of liquid phase increased, thus producing softer consistency.

Consistency.

The solubility and saturation relations at different temperatures of the various sugars present furnish the key to the consistency which may be obtained in making fondant confections. This, says Mr. Paine, is likewise true of candy of other types, and, moreover, the solubility and saturation relations are also the determining factors in the deterioration due to loss of moisture in aging. In some kinds of candy of amorphous structure, like caramels, in which milk is used, the milk solids also play an important part in modifying consistency. In candy of other types consistency is determined primarily by the presence of starch, egg albumin, and gelatin.

Candy Fermentation.

Candies containing a liquid phase of relatively low specific gravity are especially subject to fermentation, and the more troublesome culprits are torula-like yeasts which can grow in solutions of unusually high density. It has been found that the critical point for their existence is about 79 per cent. solids content. This suggests that the remedy lies in a formula calling for proportions of sugars required to yield a density of liquid phase corresponding to at least 79 per cent. solids. This can usually be attained by replacing part of the sucrose by invert sugar, either in the original ingredients or by using invertase as noted above.

Aging of Candy.

The tendency of the raw materials used and of the finished candy to absorb or give up moisture in the effort to strike a balance with the varying moisture conditions of the atmosphere vitally affect the shelf life of candy. Apart from fat rancidity and chocolate "graying," the principal feature of aging is loss of moisture. However, it is possible, by careful control of the amounts and kinds of ingredients used and the method of manipulation, to retard moisture loss, and hence aging. Thus, levulose is exceedingly moisture-loving, especially in presence of certain other substances; consequently, the use of invert sugar tends towards retention of moisture and retards aging. This is another advantage of using invertase. The incorporation of colloidal substances having strong water-binding power, such as egg albumin, gelatin, and pectin, may also be beneficial from this standpoint in certain types of candy.

Candy and Moisture.

In candies of the fondant type or those that contain a liquid phase saturated with sucrose, loss of moisture causes supersaturation and crystallisation of sucrose, thus increasing the solid phase. The candy, therefore, becomes harder and drier. In candy like "chewy" caramels, especially when too much sucrose is used, loss of moisture may be sufficient to cause enough sucrose to crystallise to change the consistency into a "crumbly" one. In hard candy, which, when fresh, may contain as little as 1 per cent. of water and in which the sucrose resembles a supercooled melt, the absorption of a small amount of moisture on the surface greatly accelerates the transition of glassy sucrose into a crystalline condition. As a result, the hard candy loses its lustre and transparency, and finally reaches a crumbly condition. Similar phenomena have to be guarded against in the making of glass and clear glazes.

New Candy Types.

Enough has been cited to give an inkling of the nature of the physics and chemistry underlying the manufacture of candy. When we know more about all the physical factors concerned and their precise interactions upon such qualities as texture and consistency, and also more about the colloidal chemistry of candy, we shall be in the position of control; very likely it will be a relatively simple matter to produce a candy of any desired qualities. Mr. Paine cites an illustration in the production of a new type of candy (Schneller, U.S. Patent 1,551,175, 1925) containing dextrose instead of sucrose in the solid phase, the liquid phase containing levulose and being saturated with respect to dextrose. This is stated to be a distinct novelty, in that in all the usual types of candy containing both liquid and solid phases, the latter consists of sucrose. On account of the difference in physical characteristics of dextrose and sucrose crystals, a confection of this type has a consistency quite different from the sucrose type.

"Yorkshire" Pudding.

In 1920 the Frankfort a/M. Chamber of Commerce gave a decision to the effect that if a sausage were labelled "Frankfort Sausage" it would be taken to mean that it was manufactured in Frankfort. Similarly, the designations "Vienna Sausage" and "Worcestershire Sauce" are geographical rather than descriptive.

In its recently issued "Regulations Governing Meat Inspection," the U.S. Government takes up the same viewpoint.

Practice over here seems to be varied. There have been clear cases of misrepresentation in which beet sugar crystals were sold as Demerara and New Zealand lamb as Argentine, but who minds if his Yorkshire pudding hails from Cheyne Walk or his Chelsea buns from Middlesbrough?

By the Merchandise Marks Act, "a seller who sells any goods to which a trade description has been applied warrants that the trade description is not false. Any description, statement, or other indication, whether it is of a direct or indirect character (*a*) as to number, quantity, or weight of any goods, or (*b*) as to the place or country in which the goods were produced, or (*c*) as to the mode of producing them, or (*d*) as to the materials of which they are composed, or (*e*) as to their being the subject of patent privilege or copyright, is a trade description. New Zealand lamb would probably be a trade description under (*b*), Vienna bread under (*c*), and Worcestershire sauce under (*d*)."

Trade with America.

The immense sums of money that are lost to British manufacturers by reason of their lack of knowledge of the American markets was the subject of lamentation of Mr. Charles S. Du Mont, the British financier and manufacturer, who sailed for America in the United States liner *America* on January 14.

The number of British manufacturers who realise that there is a potential market for their goods in the United States of America but who are too doubtful of their chances to take a risk, is very large, but the number of British manufacturers who never contemplate the United States as even a possible market is phenomonal.

Mr. Du Mont, who is primarily interested in the canning industry, quotes the case of British jams and preserves. America, in spite of her magnificent supplies of fruit and sugar, cannot produce jams of the quality of our own. And although there is already a very considerable export of jams from this country, Mr. Du Mont considers that this could be trebled within a year if the British jam manufacturers would study their American market.

Mr. Du Mont went to attend the International Canners' Convention, which opened in Chicago on January 21. More than 4,000 delegates were present. He sees a great future for the British canning industry, which has increased by 50 per cent. in the last five years, and which he considers to be going ahead faster than any other British industry. He pointed with interest to the fact that almost all the tin used by American canners comes from Wales.

The Manufacture of Margarine

By P. S. ARUP, M.Sc., F.I.C.,
Formerly Chief Chemist to English Margarine Works (1919), Ltd.

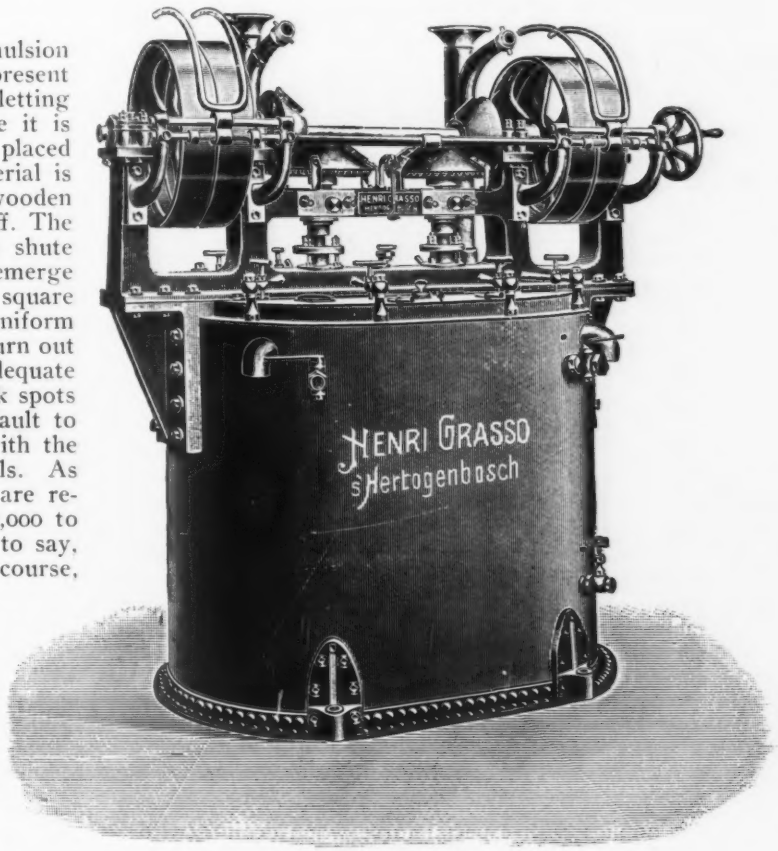
In the first and second parts of this important article, the author presented a full discussion of the raw materials employed in the industry, the methods of using starters, the use of milk powders and colouring matters, and the operations of churning and dry-cooling. The present article deals with water-cooling, the after-treatment of the cooled emulsion, and problems of the margarine emulsion.

PART III

Water-Cooling

IN THE earlier water-cooling system, the emulsion was fed into large tanks of ice-water, but at present the plan employed is nearly always that of letting it run out into a long wooden shute, where it is immediately met by a spray of ice-water placed across the top of the shute; the cooled material is then allowed to run down the shute into wooden waggons in which the water can be drained off. The temperature of the cooling water from the shute should be about 2° C., and the water should emerge at a fair pressure, say at 30 lbs. to 40 lbs. per square inch. It is absolutely essential to secure the uniform cooling of the emulsion, or the product will turn out lumpy. Whichever process may be used, inadequate cooling will result in a margarine having dark spots or lumps, but it is perhaps easier for this fault to occur with the water-cooling process than with the other, owing to lack of attention to details. As mentioned above, large quantities of water are required for satisfactory working, say some 2,000 to 3,000 gallons per ton of emulsion. Needless to say, this water cannot be recovered, but it is, of course, allowed to pass through a system of settling tanks to recover the waste fat which it carries away.

The cooled emulsion must always be of a uniform consistency or structure, whether it be in the form of flakes as produced from the double drum system or in the more or less powdery states as produced by the other systems. The presence of masses of material derived from emulsion which has been allowed to run together before being properly cooled will invariably result in one or other of the troubles mentioned above. From another point of view, a thorough and instantaneous cooling is also essential, for as is well known, at any rate to the scientifically trained, substances always tend to form the smallest crystal when rapidly converted from the liquid to the solid state, while, if the cooling is gradual, the crystals or grain that are formed will be large. Fats are no exception to this rule, and this applies especially to the vegetable fats. Too slow a cooling is accordingly found to give rise to an unpleasant grittiness in the texture of the finished product, which cannot be eliminated afterwards.



Emulsion Churn.

A very strongly built type of Churn with Top Motion and Twin Belt Driving.

4. *The After Treatment of the Cooled Emulsion.*—Before undergoing further treatment, the cooled material is allowed to stand for periods varying from about four to eight hours, in order that the crystallisation of the fats may be completed. As may easily be demonstrated, fats do not solidify completely and instantaneously on being cooled a few degrees below the setting point, as does, for example, water, and it may be shown in the laboratory that the melting

point of a sample of fat rises steadily during a considerable period after it has been cooled from the melted state so as to become apparently to all intents and purposes a solid. The vegetable fats set more sharply and completely than the animal fats, and consequently do not require to be kept so long before further treatment. This quality of setting hard is sometimes noticeable in a certain brittleness in the cheap vegetable margarines, although as a matter of fact the melting points of the vegetable blends of fats are, as a rule, appreciably lower than those of the animal fat blends. During the churning and the subsequent period of standing, the material contains the maximum quantity of milk, and this is the time when the fat takes up the flavour from the milk, much of which is eliminated during the working, the amount of milk eliminated depending, of course, on the proportion thereof added in the churn, as the water content has in all cases to be reduced below 16 per cent. in the finished product.

Working

The object of the working is to knit together the flaky or powdery material so as to produce a margarine of pliable and homogeneous texture, and this is generally achieved by passing the material between pairs of serrated wooden rollers placed in series; in the "Grasso" roller, which is very widely used, the material is conveyed from one pair of rollers to the next by means of rotating wooden spirals. Sometimes this stage of the process is carried out by working in a large butter churn—*i.e.*, submitting the material to a process very similar to the working of butter after it has been churned—this, of course, entails filling and emptying the churn, whereas the working of the roller just described may be made more or less continuous; it may, however, be remarked that whereas the churns may be cleaned comparatively easily, by filling them about one-third with hot lime water, closing and running full speed, the cleaning of the roller satisfactorily is a very laborious process, involving the scrubbing of many parts which are not all equally accessible.

Cleanliness

It goes without saying that the cleaning of all food machinery is a matter of prime importance, and that this applies with especial force when dealing with a perishable food like margarine. From the hygienic point of view it is unfortunate that no material has as yet been discovered to take the place of wood in the essential parts of margarine working machinery, for it is in a sense practically impossible to clean a wooden surface thoroughly so that it will remain technically speaking clean when standing idle. A scraping taken from the surface may be practically sterile immediately after cleaning, but after standing idle for about two days, the surface will be found again to be heavily infected with yeasts and moulds which have grown out from the pores of the wood. It is, therefore, highly desirable to clean all woodwork immediately before starting to use it again, and this is absolutely necessary if it has been standing idle for any considerable period.

The Blender

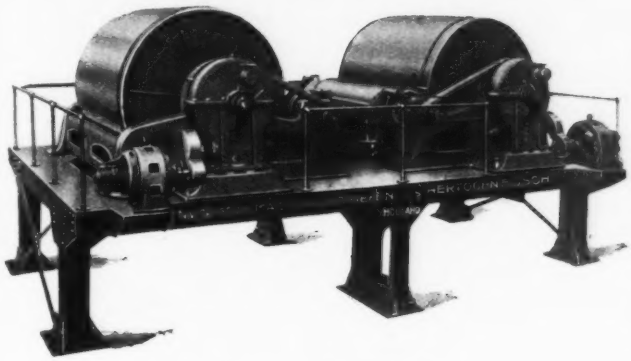
After working, the margarine is passed through the blender or mixer, a tinned iron vessel furnished with two rapidly revolving metal blades, one of which revolves at twice the speed of the other. The capacity of the blender is usually 1 cwt., but

Mixing Machine.

sometimes 2 cwt. The speed of the blades is sometimes 400 and 200 revolutions per minute, but equally good results may be obtained with half these speeds; as a matter of fact, it is a question whether the speeds could not be still further reduced with advantage, blending for longer times if necessary, as the texture of the material is apt to suffer through over blending at high speeds. In butter blending, slow working blenders of large capacity are used for this reason. The time of blending may vary from one half to four minutes, according to the hardness of the material, depending on its composition and temperature. The process must be stopped immediately the required texture has been reached.

Added Materials

The salt and preservative (if any) are usually added in the blender. Occasionally egg yolk is also added



Cooling Drum for Margarine.

here with the object of causing the margarine to retain its water more perfectly than is sometimes the case; egg yolk is certainly effective in this way, but only if used in amounts which render the cost rather heavy, and it is a better policy to guard against the defect of loose water by paying close attention to the proper emulsification of the material at the outset. The blending together of different qualities of margarine is usually not favoured, it being considered best to manufacture the composition required from the outset, but if butter is to be mixed with the margarine, as is done occasionally, this is generally done in the blender. It is not permissible by law to add more than 10 per cent. of butter to margarine; the percentage will generally be taken as butter fat in the total fat, though if there was any appreciable difference in the water contents of the butter and the margarine to which it was added, this figure will not correspond exactly with the actual weights mixed together. The determination of small amounts of butter in margarine may be carried out with fair exactness by the Reichert-Meissl-Polenske-Kirshner method, the indications being far more reliable than in the converse case when it is desired to estimate small quantities of margarine added to butter.

Boric Acid

The question as to the preserving value of boric acid need not be discussed very fully here, as the exclusion of this material is now practically an accomplished fact. In the writer's opinion, the manufacturer will not stand to lose much by the change, the preservative value of boric acid being very much a matter of faith. Very possibly yeasts and moulds such as are found in a margarine factory have become acclimatised to boric acid; one has only to see the luxuriant growth of these organisms which can be obtained on a plate culture of nutrient medium containing 3 per cent. of boric acid to come to suspect that this may be the case. In this connection it may be interesting to note that a certain species of Penicillium mould named "roqueforti," which is used for the inoculation of Roquefort cheese, is selectively cultivated in a medium containing formaldehyde, having become acclimatised to this powerful antiseptic.

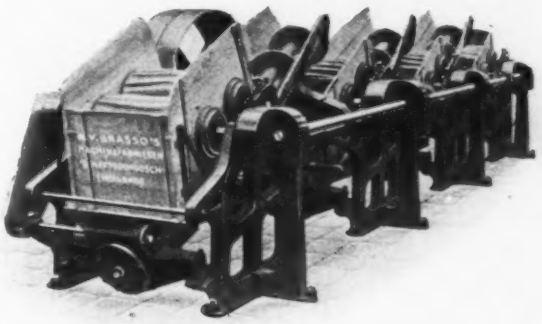
Salt

The keeping power of margarine is improved by increasing the proportion of salt, but for the sake of flavour one can rarely go much above 1·5 per cent. of salt. The writer has been informed that in America, where it is customary to add 3 per cent. or more of salt, there is very little difficulty in respect to the keeping of margarine; very possibly this is the case, but, on the other hand, such heavy salting will possibly tend to mask incipient rancidity or similar defects, while it must also be remembered that the general quality of the butter against which margarine has to compete in America is far below the standard to which we are accustomed here.

The preserving action of salt or other material added with the object of preserving depends to an appreciable extent on the water percentage in the margarine. For example, suppose two samples of margarine to contain 1·5 per cent. of salt, but one of them to contain 11 per cent. of water and the other 15·5 per cent. of water. The concentration of salt in the aqueous portion of the first sample will then be 13·6 per cent., while in the second it will only be 9·7 per cent.—*i.e.*, about 28 per cent. lower. It may be well to bear such relationships in mind in cases where the keeping of the product is likely to be attended with difficulty.

Spoilage

The spoiling of margarine is in the great majority of cases due to the action of certain common moulds, notably varieties of Penicillium, Cladosporium, and Oldium, and also of Torulæ—*i.e.*, small yeast-like organisms. The yeasts and moulds thrive in an acid medium such as is provided by the lactic acid in the margarine and with ready access to atmospheric oxygen. The latter factor explains the comparative difficulty experienced in keeping margarine in small packets, in which state it naturally exposes a far larger surface to the air than if kept in bulk. As



Multiplex Roller Machine.

Has Four Consecutive Sets of Rollers; can be Driven either Directly or Indirectly. At the End of the Machine is an Arrangement for Forming the Margarine.

the spoiling progresses, the fat is attacked by the above organisms to an increasing extent, and rancid margarines very often contain high proportions of

(*Continued on page* 34.)

Food Problems in Corsica

By T. H. FAIRBROTHER, M.Sc., F.I.C.

IN A hollow in the hills near Piana, overlooking the pellucid waters of the glorious Golfe de Porto, sheltered by the jagged Roches Rouges, a spot not unlike the Devil's Cheesering in Devon, I found a strange little food factory.

I had left the road and was wandering idly over the hillsides, when out of the silence I heard a man's voice singing a strange Corsican melody, almost a monotone. To the right I saw a tripod of sticks about seven feet high, from the top of which were suspended some half-dozen pots, somewhat like glue kettles. The thought of brigands—the wild men of Corsica—flashed across my mind. Should I retreat? My curiosity won and I rounded a tall rock, and there saw a bronzed man sitting, tailor fashion, plaiting little baskets from rushes, and near him a small boy lay asleep in the soft sunshine. He was amiably and conversationally inclined, and I soon discovered that here was a food-producing unit. He traded with none for his raw materials; he had no labour troubles, having no employés; he was an independent and self-supporting unit. He was the proud possessor of 100 goats, and every evening his son and dog rounded them up to the encampment, where he milked them, and set the milk aside in the pots I had noticed on the tripods, after covering them with leaves. The next morning he and his wife converted it into cheese —that delicious creamy cheese, with a sharp piquant flavour, known as *brousse*, which is served with sugar or jelly. When the cheese had clotted it was placed into little wicker baskets which he made during the afternoon. A delightfully planned little business—no worries about land or buildings, food or factory inspectors, no rates and taxes, or overhead charges. Just a happy industrious life in the sunshine, and a sufficient production to supply him and his dependents with what they needed. The whole question of the food problem in Corsica is typified by that little episode. It is quite primitive and casual. It is not hard to understand why Napoleon could endure the gastronomical privations of his military campaigns so well, brought up, as he was, on the spartan feeding of La Corse.

The island is mainly dependent on the mainland for flour and cereals. There is a certain amount of corn grown, but it is cut green for fodder. Much of the flour is imported from Italy, and, hence, most of the bread to be had is darkish in colour, the flour being the 85 per cent. Italian Standard—a lower grade flour than English white flour with about 15 per cent. more offal in it. The price of bread and flour is fixed by law, and notices regarding the prices are displayed in various places. The bread is made on the island by the long fermentation sour-dough process, and the dough is placed in communal ovens previously heated with wood and carbon, and usually tended by an old woman armed with a pole about six feet long, shaped like an oar, for turning the loaves and pulling them out again. The bread bakes slowly, and consequently has a very thick crust, a tough inside, and a brackish flavour. An enterprising miller in Corsica with a 10-sack plant, an adjoining bakehouse, and a baker who knew his work, would soon be able to retire. The island is becoming popular as a holiday resort, fashionable hotels are springing up on its rugged shores and in its mountain villages, and there will be an increasing demand for better food. The primitive food of the natives—rather looked upon as a joke by early tourists—will not be suffered lightly by those pampered frequenters of the Riviera, and there is scope in plenty for the enterprising man who steps in now to fill the need.

There is fruit in abundance in Corsica, oranges and lemons and stone fruits flourish, to say nothing of the delicious nespolis, the *fraise de bois*, and the cultivated strawberry. Vegetables seem to grow for the asking, and peas and asparagus are common. The possibilities are there, but there seems to be no organised culture and no attempt at fruit or vegetable preservation. The vines are fairly well looked after for the Cap Corse wines (but these vineyards would bring a blush of shame to the vine grower of Provence, proud of his Cote du Rhône vintages), but there is plenty of land which could be utilised profitably for fruit and vegetable growing, in conjunction with a preserving and canning factory. Groves of olives thrive in the wildest profusion, but many more olives fall to the ground than are ever consumed.

The goat is the mainstay of Corsica. She provides the milk, the butter, and the cheese, and after a long and arduous life on the hills, appears on the table as *cotelet de veau, entrecote de bœuf, selle de mouton*, and as a variety of other appetising names. It is surprising what can be done with a homely goat, if one has enough imagination and breadth of vision.

Fish is plentiful—but the fishermen have to be driven to catch it. There is a sort of fisher conscription; those who live by the sea and are classified as fishermen are compelled to fish for a certain number of hours per month, but often they have to be driven by the gendarmes to the boats. There are many varieties of fish—enough, indeed, to make the most enchanting *bouilla basse*, and the langouste of Corsica is equalled only by the homard of Gorey, or the fresh boiled lobster of Cornwall.

Corsica is a tragedy for the gourmet—a land of wasted opportunities. Rivers full of trout, bays with fish for the catching, fields well watered and basking in the Mediterranean sunshine tempered by the sea —there "every prospect pleaseth and only man is vile." The bone laziness of the men, failure to utilise the opportunities lavishly offered by nature, brings about a dull and lean table, and engenders an appreciation never properly realised before of Sussex beef, Surrey capon and Southdown lamb, and good, white English bread.

A Triumph for Modern Canning Science

The other day it occurred to us that our readers would be interested in having the views of Sir Arbuthnot Lane on the much-debated question of canned foods. Accordingly, our assistant editor obtained an interview with the famous doctor and writer, of which the account follows.

"AS THE representative of FOOD MANUFACTURE, the majority of whose readers are more or less directly interested in the production of preserves of one kind or another, I should like to ask whether you, Sir Arbuthnot, as a leader of medical thought, are in favour of canned foods in principle and in practice?"

"The *ideal* thing, of course," he replied, "would be for everyone to grow his own food in his own garden, and the encouragement of that ideal, however unattainable for the majority, must remain one of the central objects of the social reformer. But the vast majority of our industrial populations can never hope to achieve this result, and none can so supply themselves for more than a few months of each year. So, granting the obvious fact that a generous consumption of fruits and vegetables, while in season, is most desirable, we have still to consider the problem of how to supply these excellent foods out of season. It is precisely here that canned foods serve a real and essential purpose in our highly civilised life, and it is, therefore, imperative to insure their purity and unimpaired food value. Happily, the ascertained scientific facts relating to food canning according to the latest methods are such as must inevitably dissipate what popular prejudice may still exist on the subject. Canned foods are now to be found every day, in some form, on the dining tables of most households throughout the world."

"That's true, Sir Arbuthnot, but do you really think them not only necessary, but desirable?"

"I certainly do."

"Would you please give me some reasons for thinking so?"

"There are plenty of reasons. The canning of foods has solved, in most cases, the difficult problem of linking up zonal food production with easy and cheap transport, in convenient forms, to the areas of mass consumption, providing nutritious and appetising foods for millions of people. In this age of huge production of foodstuffs the process of canning has prevented an immense waste of the supplies not needed for local consumption. Quick railway and other transport are in most places more than adequate to supply current local needs, and at the same time to deal with any surplus produce within imaginable proportions. The waste of this surplus is avoided by its being rapidly carried to centres where modern methods of canning provide a safe and ready means of storage for future use. Another point of importance is that the fresh condition of crops only extends at most to a week or two, and generally is limited to a few days. Canning on modern scientific lines extends the economic and food value of crops indefinitely, thus fully exploiting their utility for the public.

"Also, by opening up new avenues of consumption in zones where cultivation yields prolific results, production has been enormously increased, and the already fruitful resources of the earth multiplied to a degree which has added vast sums to the world's wealth, and rendered the prospect of further increase almost limitless.

"Lastly, a more equitable distribution of the world's best food supplies is also achieved by canning, as well as a greater variety of diet and added incentive to the appetite."

"Those are certainly points of great importance, Sir Arbuthnot. Now, with regard to certain misconceptions as to the possibility of poisoning occurring through the canning of fruit and vegetables, have you personally any opinion on this point?"

"It has long been known to the canning industry, for instance, that oxygen, even in very small quantities, is a detrimental if enclosed in a can of any food—more detrimental with some foods than with others. In a can of peas, for example, a very few cubic centimetres of oxygen results, the morning after canning, in a red oxide of iron in the head space. A few days later this red oxide of iron is converted into black ferrous sulphide by the hydrogen sulphide supplied by the food. This black substance is objectionable from the point of view of appearance, and canners have long known that they must make every possible effort to exclude oxygen from the can, so as to prevent undue formation of sulphide. It has also been known to scientists that a very small percentage of oxygen left in a can causes undue corrosion, which continues even after the oxygen has been used up. As a result of many researches, however, the commercial canning of foods is now carried out so efficiently that the exclusion of oxygen overcomes these defects."

"Many people still believe that the accessory food factors, vitamins, are either destroyed or reduced in quantity by the various processes of canning, particularly vitamin C. Do you?"

"A long series of studies carried out in Columbia University, U.S.A., and in the University of Durham here in England, and a very large number of scientific papers published in the journals of Europe and America, have established certain facts beyond cavil. It has been found that the only vitamin susceptible to injury during cooking or canning is vitamin C, and possibly to an even slighter extent, vitamin D, *but so small is it that it has not always been possible to establish the fact definitely by feed-*

ing experiments. It is almost universally accepted that vitamins A, B, and E are not injured by ordinary cooking or canning methods."

Some Striking Data

Then, quoting from figures, Sir Arbuthnot gave the following results of recent experiments: Canned tomatoes are richer in vitamins A and B than orange juice, and a little lower in vitamin C.

Commercially, canned tomatoes were found, on being dried and tested for vitamin contents, to be equivalent to, or more potent than, butter fat in vitamin A, and they have proved to be a good source of vitamin B. Two grammes of canned spinach have been shown to contain a quantity of vitamin C equal to ten grammes of freshly gathered spinach cooked domestically.

From two to three grammes of canned peas were found to be equivalent to six cubic cm. of milk as a source of vitamin B, while two grammes of raw peas were equivalent to five grammes of home-cooked and three grammes of canned peas as a source of vitamin C.

Canned peaches have been found to be equivalent in vitamin content to raw peaches purchased on the market during the peach season.

Cabbage was canned in a well-known laboratory with a view to finding the effect of time and temperature on the destruction of vitamin C. It was shown that their influence is small and that there is less destruction of this vitamin C than with open cooking.

Apples held in cold storage for six months showed a marked loss of vitamin C, while those canned showed no evidence of any loss of vitamin C eight months after being canned.

In the case of peas, no canning process appreciably affects vitamins A and B. Reheating tinned peas does not materially reduce their vitamin C.

On being asked if what he had said about fruit and vegetable canning applied in general to meat, fish, and other forms of canning, Sir Arbuthnot replied:

"Yes, I think so. The meat packing industry has more than shared in the immense improvements which canning generally has experienced as a result of scientific research. Almost all the canneries are situated near to the great pasture lands. The processes of cooking, canning, and sealing are carried out under perfect conditions.

"Two British scientists found, by careful experiments, that meats properly packed are richer than ordinary fresh meat in total solids, and have a higher protein value."

A Specialised Industry

Sir Arbuthnot was of the opinion that canning has come to stay. "It has become a special industry," he said, "with just as secure a place in the economy of modern communities as shipbuilding, mining, or milling. It employs vast numbers of men and women, whether in the growth of crops, the transport of the products to the factory, the feeding of herds, the mining of tin; and it calls for the latest discoveries known to science for the improvement and perfection of every phase of the process. The conditions introduced by modern science are such that foodstuffs canned under them are at least as pure as, and in many cases purer than, is the case with natural foods treated with less care under ordinary trade conditions."

"What has impressed you most during your visits to canning factories?"

"Principally the tremendous complexity of the various processes, and the extreme care taken to insure proper grading and washing, the sterilisation of cans, their special lacquering to preserve colour in the case of corn and some shell-fish, the exhaustion of all air which might cause oxidation, the closing and testing, cooling, syruping and brining, the use of scales and other measures to insure absolute accuracy in weights."

"Do not you think it a pity, Sir Arbuthnot, that so many misconceptions should still exist in this country about canned foods?"

"I am glad you mention that point, because there is a society, of which I happen to be the president, which spends its whole time in combating misconceptions about all kinds of food, and instructing the public in new food matters of interest; I am referring to the New Health Society. As a matter of fact, it has recently issued a report on 'Canned Foods' drawn up by three members of the Society's Food Committee, which is composed of about a dozen of the country's best-known specialists, among them such authorities as Sir Bruce Bruce-Porter, Professor R. H. A. Plimmer, Sir William Willcox, and Dr. John Campbell. I can strongly recommend anything they may publish as being of first-class interest to the readers of FOOD MANUFACTURE as well as to that thinking part of the general public for whom, of course, it is intended in the first place."

(*Continued from page* 31.)

free fatty acids. Some attention should be paid to wrapping papers or parchment, which should be free from reducing carbohydrates or glycerine. This is not always the case, and there is a distinct danger of these substances favouring the growth of yeasts and moulds on the surface of the margarine, while in bad cases the paper itself may be seen to be attacked by the organisms in question.

A friend of the writer once gave the following excellent advice to margarine manufacturers: "There are three things to remember in making margarine: the first is cleaning, the second is cleaning, and the third is cleaning." If one interprets this advice as including the selection of good, clean milk and fats as raw materials, one will certainly have gone very far towards the turning out of a perfect product.

Soya Flour

It is not unlikely that the erection, now nearing completion, of a factory in North London to produce soya bean flour by the Berczeller Process will mark the first step in the founding of a new British industry.

The First Soya Flour Factory in England. This is now nearing completion.

AN EDITORIAL note made a month ago has brought in several requests for further information on soya bean products and the Berczeller Process.

These remarks have aroused great interest in Germany, where they have been quoted in at least one periodical circulating amongst food manufacturers.

The use of the soya bean as a daily food in Northern China goes back 2,000 years. Perhaps this accounts for the great difference in stamina between the hardy soya-eating Chinese of the North and the Southern rice-eating Chinese. It is said that these Northerners think nothing of walking six or seven hundred miles to the nearest market town with a heavy pack of cotton upon their backs.

It has been said that East and West never meet—though what is actually meant by this is not altogether clear. What is certain is that Western nations borrowed from China two inventions which profoundly altered their whole history; these were paper and gunpowder. Now it looks as though we are indebted to China for another gift, the soya bean, which is probably the most complete and concentrated natural foodstuff known.

The best (Canadian) wheat contains 70 per cent. of carbohydrates in the form of starch, about 2 per cent. of fat, and about 13 per cent. of protein. Soya flour, which has passed through the special milling and fractional distillation process discovered by Dr. Berczeller, contains no starch, 24 per cent. of soluble carbohydrates, 20 per cent. of fat, and about 40 per cent. of protein. The absence of starch is interesting in view of the fact that dyspepsia is principally caused by over-consumption of starchy foods. Starch, on the other hand, is heat-producing, so that it would seem that a loaf containing, say, 10 per cent. of soya flour would give excellent and economical dietetic results. The total phosphoric acid in soya flour, as determined by a recent analysis, is nearly 1·5 per cent.; one-tenth of this is in the form of Lecithin. The proteins of soya resemble those of meat, and it would therefore be possible to replace to a certain extent a meat diet by a soya one, 1 lb. of soya flour being roughly equal to 2 lbs. of lean meat in protein value. Of the vitamins, soya is richer in A and D than in B. Professor Dr. Moll, of Vienna, recommends the use of soya bread for consumptive children.

At present soya flour is being manufactured at Vienna and Budapest, and the erection of another factory in the Hungarian capital is said to be necessitated by the large demand there. So far as England is concerned, the first Berczeller installation is approaching completion at a factory in North London.

Soya is used to advantage as an ingredient of chocolate, replacing to some extent the relatively expensive cocoa-butter. A chocolate containing 10 per cent. soya, which was tested, had a slightly bitter, but quite attractive flavour. Another sample, with 20 per cent. soya, had a milder taste. A cheaper chocolate, containing, for the first time, neither cocoa-butter nor any substitute beyond 10 per cent. soya, had an extraordinarily agreeable flavour. There can be little doubt but that soya-chocolate will take its place amongst the concentrated foods used by explorers and others.

In Vienna, soya flour is being used to an increasing extent in scones, biscuits, and other confectionery. It acts as an admirable shortening agent. As a binder and filler, it is also being used for sausage-making, replacing farina and other fillers.

In this country, until the invention of the Berczeller Process, soya was only used as a source of cooking and margarine oils. In addition, soya bean oil is used in the manufacture of soap, paints, varnishes, and many other products. It is the most versatile of the vegetable oils.

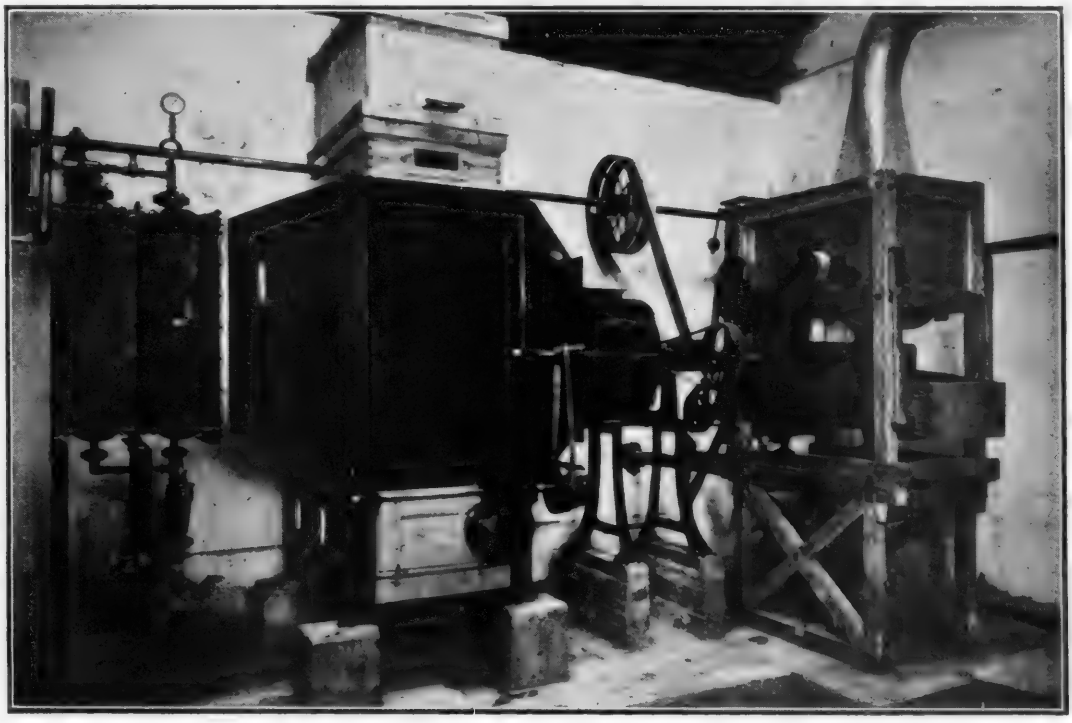
Professor T. R. Parsons wrote in the *Lancet* (January 29, 1927): "The attempts made so far to popularise the soya bean as a staple article of diet for Europeans have met with little or no success. One such attempt was made in Germany during the war, but it was found that the consumption of the beans in quantities sufficient to supply the nutritional needs of man led to digestive disturbances and other disagreeable after-effects, so that the diet could not be tolerated for any length of time. Recently, however, Berczeller, working in Vienna, has devised a new process of milling, combined with fractional distillation, whereby the obnoxious constituents can be removed and a meal of highly nutritional value obtained.

"This special soya flour forms a slightly yellowish

flour of agreeable and appetising appearance and a faint almond-like taste."

Professor Parsons concluded his article by suggesting very strongly the desirability of instituting a large-scale investigation, and said that the introduction of soya bade fair to become a greater advance in the problem of national nutrition than the introduction of the potato.

Though that was two years ago, there has, of course, been no large-scale investigation, but there are others who are alive to the situation. In a recent interview given to Dr. Berczeller, Mussolini declared his intention of introducing legislation enforcing the use of a certain amount of soya flour in the manufacture of polenta, the staple maize foods, and bread.



Plant for Treating Soya Beans by the Berczeller Process.

Preservatives in Food

THE International Office of Public Hygiene at Paris has sent out a questionnaire to all countries relating to the preservatives and colouring matter in food permitted for home use, for export, and for those at sea. Replies received from the Polish Republic and from Japan have been published as a supplement to the monthly *Bulletin* for August issued by the International Office. In regard to Poland, the replies are no longer valid, since in July, 1928, a new law came into effect based on the practice of the Austrian and Prussian provinces. In Japan the only legal preservative is salicylic acid, which is allowed in "saké," the national beverage, to the amount of 208 mgm. per litre. The tolerated amounts of preservatives seem generally to be higher in our own country than in the other countries mentioned. On the other hand, we treat the whole world alike; the regulations made by the Minister of Health appear to apply to all articles manufactured for sale or sold, whatever their destination. The Japanese restrictions also apply to all alimentary products which are manufactured in Japan, whether they are destined for consumption in the country itself or for exportation. Poland specifically excluded from the restrictions "alimentary products destined to be exported or employed as provisions aboard ships." It is difficult to gather whether this exemption was due to a disregard for the welfare of the seafaring man and the foreigner or to a deliberate choice of the supposed lesser of two evils on a long voyage—preservatives or putridity. It may be significant that the two island States, England and Japan, apply the same restriction to foods for the sailor as to those for the landsman. Even in these days of hustle on the sea, the crew of a tramp steamer get limited opportunities of enjoying fresh food.—*Lancet*.

Tobacco Attacks Food

Are we going to have American throat-cutting tactics on this side of the Atlantic?
"Sweeten the Day with Candy."

War on Food

MUCH PRINTERS' ink seems to have been spilt in the advertising war which has been raging now for some months between the Tobacco and Sweet Industries of America.

The Candy Industry opened a general advertising campaign at the beginning of last year with the slogan "1928—Our Year," following this by a widespread propaganda in all sections of the Press—the circulation of the publications containing "candy information" being over 50,000,000 in some months. On one occasion a broadcast "hook-up" is estimated to have reached 25,000,000 pairs of ears. The whole culminated late in the year with "Sweetest Day," and the industry seems to have benefited considerably.

The slogans most used were "Candy for health," "You can get thin comfortably on Candy," "Sweeten the day with Candy," and "Do you eat enough Candy?" about none of which is there anything aggressive or in bad taste, it is important to note.

Tobacco Hits Out

It was in October that the American Tobacco Company began to hit out. Since then, full-page advertisements in the New York daily Press have been showing testimonials from all kinds of national celebrities expressing in no uncertain manner their preference for a smoke rather than a sweet. Some similar advertisements are also appearing in several of the national weeklies, but the Sweet Food Industry, which is the object of the most aggressive advertising ever known, seems to have regained its second breath after the first shock of consternation, and, on November 23, a meeting was held at the Advertisers' Club in New York, at which there were twenty-one representatives of the leading companies in the business. Their statement after an examination of the facts was as follows:

"During the past month or six weeks one of the leading cigarette manufacturers has been advertising its product as an aid to health, and promoting the sale of its cigarettes as a substitute for "Sweets," using for this purpose alleged testimonials signed by society leaders, stage and motion picture stars, famous athletes, and others. This advertising is being broadcast over a nation-wide radio network and published in a number of newspapers and magazines, and the company manufacturing these cigarettes makes no secret of its intention to extend this type of advertising until it covers the entire United States. In the opinion of the representatives of the national food industries this advertising is an unfair and untruthful attack upon all sweet food products. Its purpose is to increase the use of this particular brand of cigarettes by decreasing the consumption of wholesome foods. In so far as it tends to promote the smoking of cigarettes by boys and girls and encourages undernourishment, it is contrary to public welfare and a menace to public health.

"After repeated unsuccessful appeals to the cigarette manufacturer to discontinue, or eliminate, the objectionable features of this advertising, this statement is being issued for the purpose of placing the situation before the members of the sweet food industry to the end that the public shall be correctly informed."

Advertisement of the Type mentioned in this Article. The Part Outlined reads: "Keep a Slender Fashionable Figure. Overweight must be avoided. Too many Fattening Sweets are Eaten. Women eat too Rich and Fattening Desserts. Hence this Advice—Better to Light a 'Lucky' whenever you Crave for Fattening Sweet."

Defensive Measures

An Organisation Committee was subsequently formed, and the counter-reformation of American taste, in the form of a nation-wide circulation of direct mail material instructing all concerned in defensive measures, is actively under way. Those to be

circulated are the importers, manufacturers, bakers, jobbers, and retailers, etc., in the following industries: Sugar, cocoa and chocolate, confectionery, bakery goods, dairy products, preserves and canned foods, dried fruits, prepared desserts and syrups, all of whom, of course, are directly affected by the action of the American Tobacco Company.

The proposed campaign will organise every group company and individual in the sweet food industries for defence work each in his own field and locality. The purpose of the Organisation Committee is apparently not to form a super trade association, but a representative committee which can function quickly and forcefully in meeting such emergencies as that presented by the present anti-sweet advertising. The members of this permanent organisation, known as the National Food Products Protective Committee, were chosen by the different trade groups mentioned.

The Tobacco Industry Justifies its Advertising

In the meantime the Tobacco Industry is very cock-a-hoop about its undoubted recent success, and points to the fact that rival industries have always had to fight a life and death struggle.

The plumbing and heating business is the mortal enemy of the textile industry, it is said, because warmer homes mean lighter clothes. By increasing business the bus lines must take something from the railways, the bricklayer from the timber, and marble from cement. The silk people are fighting the woollen people, the leather people are fighting the rubber people, and so on. It admits that the competition has now gone a step further, but claims it to be justified according to every standard of American competitive civilisation.

Mr. George Washington Hill, the President of the American Tobacco Company, was recently quoted by the *Sales Management and Advertisers' Weekly* (New York) as saying: "Our reasons for starting the campaign are obvious enough. The American people eat too many sweets. The 'per capita' consumption of sugar here is 100 lbs. per year—nearly five times as much as France and eight times as much as Italy. Obesity and attendant ills can be traced directly to this cause," and he cites a report of the Health Extension Bureau as follows: "To reduce weight in many cases it is better to eliminate sugar altogether." He went on to say: "It is our business to state the facts as interestingly as possible and to sell 'Lucky Strike' cigarettes. We don't want to argue with anybody. If any of the 'Sweets' people want to start an argument let them do it with the authorities."

The Real Reason

According to Mr. Hill, the increase in the sale of Lucky Strike cigarettes in the first two months of the campaign was 47 per cent. more than in the same period for 1927, despite the fact that December is normally a bad month in the wholesale tobacco business, and he announces that £2,500,000 has been appropriated to the advertising of Lucky Strike cigarettes alone during 1929. It is clear that deep issues have been raised—namely, the whole question of *Truth in Advertising* and the use of *Radio for Advertising Purposes*—and, in fact, the United Restaurant Owners' Association, a powerful organisation which has come to the support of the sweet trades, has already sent a strongly worded protest to the Chairman, Ira E. Robinson, of the Federal Radio Commission of Washington, against the "insidious, unmoral, and outrageous propaganda recently undertaken through broadcasting by powerful cigarette interests." (The Federal Radio Commission was appointed to protect the interests of the people, and holds that such benefit as is derived from advertising must be entirely secondary to the interests of the public.)

The protest maintains that the public's true interests are not being protected when it is being broadcast to 10,000,000 houses that smoking is an aid to health, that the way to retain the fashionable figure is, not by exercise or moderation, but by smoking more cigarettes, and that growing boys and girls are told that smoking is harmless because leading athletes say so.

In England, Too?

Are we going to have similar throat-cutting tactics on this side of the Atlantic?

One cigarette manufacturer has already appeared with advertisements which resemble the American type we have mentioned. In one of these a business man is asking a butler, who symbolises a particular brand of cigarettes, where he has been. The butler replies that he has been lying low and watching things, and, judging by the subsequent remarks about the *spreading habit of eating strange, soft foods*, it is obviously the advertising of the American Tobacco Company that he has been watching. Food manufacturers in Great Britain will watch this latest development with some interest.

Irish Butter

THE Department of Agriculture announce that on September 18 packages of butter from 209 creameries in Saorstat Eireann were forwarded to the Department's Butter Testing Station, Dublin, where they were retained under ordinary commercial conditions and examined on the 2nd and 3rd September by three judges acting independently. The marks awarded for flavour, texture, colour, and packing and finish were communicated to each of the creameries from which exhibits were forwarded.

As an indication of the high quality of butter manufactured in Saorstat creameries, it may be mentioned that 99 per cent. of the exhibits were up to the standard fixed for creamery butter intended for export, while 85 per cent. attained as high a standard as will eventually be required for the award of the National Mark.

Power Economy in the Food Factory

By "KILOWATT"

Every unnecessary bearing is a source of loss and superfluous gear absorbs power—which has to be paid for.

PART V

Transmitting Power

THE PROBLEM of transmitting the power from the source to the individual machines does not always receive the amount of attention it merits, in spite of the fact that it has a considerable bearing on the ultimate efficiency of the plant and its economic operation. A little thought will show the importance of this matter, because every unnecessary bearing is a source of loss, and superfluous gear absorbs power which, of course, means money.

An outstanding feature of the electric drive is its adaptability, and by reason of this feature it is possible to cut down transmission gear to an absolute minimum. With other forms of motive power there is usually one prime mover with endless lines of shafting and belting throughout the factory, and without going deeply into the question of power transmission, everyone knows the large percentage of loss occasioned through shafting and belting, however well designed the layout of the plant may be.

When considering the question of the most suitable, and, at the same time, most economical form of prime mover used, we have the choice of three methods:

An Example of Group Driving from Line Shafting in the Cake Making Department of a London Bakery. Note Belt Drive from Motor to Line of Shaft at Right of Photograph.

(*a*) Individual drive—where each machine is driven by its own motor;

(*b*) Group drive—where two or more machines are driven through shafting by one motor;

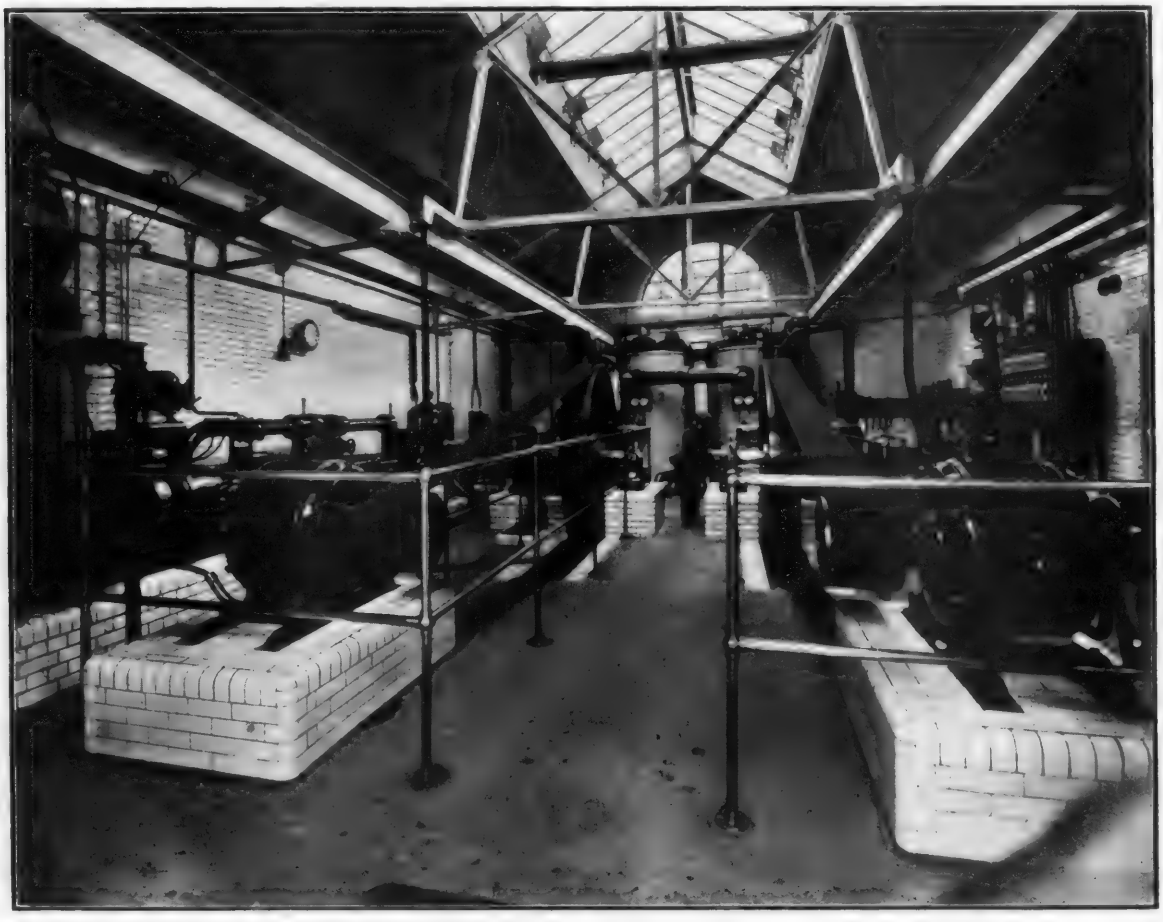
(*c*) Combined individual and group drive—a combination of drives Nos. (*a*) and (*b*).

Now each method has formed the subject of much discussion; there are earnest advocates of the individual drive and equally ardent disciples of the group drive. Those who support individual driving point out the possibilities of entirely eliminating all overhead shafting and belting, while the supporters of group driving claim cheaper installation costs and higher efficiency. It is impossible to lay down any golden rule as to what system of electric drive should be adopted in the food factory, as each case requires careful consideration on its own merits, but for the benefit of the power user who is naturally familiar with the particular conditions of his own factory, it may be as well to set out the salient features of each form of drive to serve as a guide to the satisfactory operation of electrically driven plant.

The Individual Drive

Let us take the individual drive first. Each machine becomes a complete unit in itself, and can be placed in any position convenient for operation with regard to transmission gear. Thus the refrigerating plant, pumps, hoists, and so on, can be put down in any desired position in the factory without having to consider the exigencies of the drive. Moreover, any additional machine can be added to the existing plant without having thought to shafting—an important point to bear in mind where new machines are being installed.

Should a motor develop a defect which compels its shut-down, only the driven machine is affected, and not the whole, or a section, of the plant. A point in favour of the electric motor might well be brought out at this stage. The breakdown of a steam engine or other form of prime mover, might well mean the stoppage of the whole plant for a day or more while repairs are being effected—a matter of serious consequence to the management—but in the case of the electric motor such a breakdown, the chances of which are more remote, may be easily



Example of Individual Drive. Two Belts Driven I. and E. Hall Horizontal Carbon Dioxide Refrigerating Machine for Cold Storage.

remedied by the substitution of a spare motor, a matter of an hour or two at the most, while the defective one is being repaired.

With the elimination of overhead shafting and belting by the individual drive, the lighting conditions of the factory are improved, thus increasing the efficiency of the worker, and this absence of overhead transmission gear also contributes towards the greater cleanliness of the establishment and, incidentally, will often permit of lighter building construction. It is also claimed that individual driving reduces operating costs, but this must largely depend upon local conditions; it certainly reduces maintenance costs of transmission gear.

So far as control is concerned, individual driving permits the switching off of the motor directly the machine has finished its operation, thus reducing current consumption to a minimum; whereas, in the case of a number of machines driven from one long shaft, it may happen that only one machine is in operation for a time, which means that power is being used for the entire line of shafting. The layout of a plant is also much more elastic where individual motors are used, as the rigid demands of shafting have not to be met.

The Group Drive

We now come to group driving. By reason of the smaller number of motors employed, costs are lower, and as larger size motors would be used, their efficiency is higher than that of the small motor, but as an offset to this higher efficiency, transmission losses must not be overlooked. It is also claimed that this system of driving permits of easier standardisation of motors employed throughout the factory, and the stocking of fewer spare parts, both of which points deserve their due consideration. If care is exercised in planning, the layout of the plant grouping can be so arranged as while not entirely eliminating shafting and belting, it reduces them to a minimum, and if the machines are so grouped as not to be used at their full capacity simultaneously, the collective amount of horse-power is reduced.

Briefly, these are the advantages claimed by the respective systems of electric driving, and as stated earlier in this article, must be applied according to existing conditions at each factory. Where a factory is changing over from steam to electric drive —which conversion, by the way, can be carried out without interfering with the running of the plant— it may well be that portions of the existing shafting can be utilised for successful group driving by the application of electric motors at various points. It is advisable, however, to break up the plant into comparatively small groups, according to their function as near as possible, as this allows the shutting-down of a group of machines on the completion of their work, and thereby keeping down the power consumption.

A combination of group driving and individual driving may thus frequently be adopted, and is, in fact, often the solution to the economical operation of the plant.

There are, however, certain clear cases for the use of the one machine, one motor drive, and where the power user is called upon to instal an additional machine in any particular department, he will find that this drive will serve the purpose best. Space does not always permit of an additional machine being linked up to the existing shafting, and it is here that this form of drive allows of such machine being installed in any desired position or available space.

Chain Driving

Before leaving the subject of drives, there is one other form of drive which might be mentioned as frequently solving the question of a difficult drive, and that is the use of chains. Although belting is undoubtedly the most favoured system of transmitting power, probably on account of its lower initial cost and apparent simplicity, there are cases where it is practically impossible to use it with anything like efficiency. For example, it often happens that the motor has to be placed either very close up to the shafting, or the driven machine itself, or the working conditions may be abnormally wet. In such cases chain driving will be found the best means to adopt. A positive drive is secured, cutting out loss of power through slip, and a positive speed ratio is obtained, permitting the driving and driven shafts to operate at all loads at the designed proportional speeds, and this at any reasonable distance between the shafts from approximately the same measurement required by gears up to 8 ft. or 10 ft. on big drives. Thus it is possible to effect a great saving of space by using chains for short drives, allowing of the fixing of motors quite close to the shafting or machine—a very valuable feature where space is limited. Incidentally, a well-designed chain drive will give an efficiency of from 98 to 99 per cent.

Boom in the Sugar Industry

LORD BIRKENHEAD made his first public appearance as a company director at the annual meeting of Tate and Lyle, Limited. He sat at the directors' table with his head resting in his hands, gazing intently at the papers before him, while the President, Sir Ernest Tate, delivered his review of the year's operations.

Sir Ernest stated that the changes in the rates of the sugar duty, which had the effect of reducing the import duty by three farthings per cwt. on the retail price of refined sugar, had been of great benefit to the trade. All British refineries were working on a much larger output than before the Budget. At the company's three refineries since April there had been a weekly increase of 30 per cent. in the amount of sugar melted, while they hoped in the future to melt not far short of 30,000 tons weekly. Beet sugar factories in this country were now able to refine imported raw sugar during the off-season, and it was estimated that they melted 53,000 tons of this sugar in the past year.

Some Simple Tests for Food Purity

By C. McLEAN

THANKS TO the efforts of the authorities that are responsible for the purity of our foodstuffs, the adulteration of commodities is not so common as in the past. Unfortunately, however, impure foods are still on the market. The following tests will enable buyers to determine if the foods they are receiving are pure or otherwise.

The expert coffee taster can tell by simply tasting the beverage if chicory has been added, but to the ordinary consumer this would not mean much. An infallible test is to place a teaspoonful of the dry coffee in a tumblerful of cold water, stir well with a spoon, and leave for a minute or so. If the water remains clear the coffee is pure, but if it takes on a brownish tint chicory has been added. The darker the brown tint the greater the amount of chicory that has been added.

To test the quality of sugar, burn a sample in an aluminium spoon over a gas jet. If the sugar burns away entirely it is pure, but if any ash remains adulterations have been added.

The best way to test olive oil is to pour a quantity into a small bottle, add an eighth of the quantity of household ammonia, and shake well. If the mixture assumes a milky mass the oil is pure, but if it has a granulated appearance other oils have been added.

The simplest test for butter is to place a little in a spoon and hold it over a gas jet. If the butter boils evenly it is pure, but if it splutters and a scum appears margarine has been added.

To test flour, press a sample in the hand: if, when the hand is opened, the flour retains the impression of it and appears slightly yellow it is pure, but if it falls into powder and retains its usual colour adulterations have been added.

A good way to ascertain if milk has been "creamed" is to skim it after it has stood for an hour or so. If after the skimming a slightly bluish tinge appears around the edges, the milk is all right, but if the edges appear as before the milk has been creamed. To test if water has been added to the milk dip the point of a well-polished needle into it, and withdraw, holding the needle perpendicular, with the point downwards. If the milk adheres to the point it is pure, but if all of it drops off water has been added.

Continental News

The Sugar Industry in France

"ON OUR market, the current of business continues good—occasionally we have a little relapse, but on the whole, the 'bulls' have it. One rumour was that an important refiner wished to push prices up to parity of importation, and then purchase Cubans or Javas, but this would mean that the firm in question planned ahead, which we think doubtful—they usually move from day to day.

"With the certainty that we shall have to import considerable quantities of sugar, and with our market fully protected, why should prices fall? Especially as the manufacturers are only selling their sugars slowly. This policy has been highly successful in recent years, and so there is every inducement to follow it again.

"An enthusiastic report as to French affairs has been issued by the British Commercial Attaché. It appears that we are the most prosperous country in Europe. From extracts we have seen in the Press, we should say that the account given is very exaggerated, but, of course, this makes one very popular in the country in which one happens to be stationed.

"France has certainly recovered in a most remarkable way from the disasters of the war. The French have always shown great recuperative ability, but one contributory fact is, that though we suffered enormously in loss of life, materially the damage done was to a considerable extent offset by the vast sums of money which were brought into the country by our allies, a feature which has never been insisted sufficiently anywhere that we have seen, outside our own columns. How much money did England leave in France? And the United States? But that is outside our subject."—*Journal des Fabricants de Sucre.*

The Polish Bacon Industry

From the *Braunschweigishe Konserven Zeitung:* "It is well known that Polish farmers have long been trying to capture a part of the London market, particularly with regard to bacon. The information which now reaches us from London that strong efforts are being made to establish more firmly a bacon export industry in Poland under Danish supervision with a view to the supply of the kind of bacon suitable to the English palate, seems to point to the fact that such efforts have had little success in the past."

The German Bacon Industry

"The position of the bacon export industry in Germany is not at all good, for apart from the high price of pigs in Germany, and the fact that bacon is in very little demand at home—the German taste running in other directions—the competition abroad, principally from England, appears to be so great that the only alternative to closing down will soon be the utilising of plant for other than bacon-producing purposes."

The Canning Industry in Germany: Rationalisation at Work

Fruit

THE STOCK of 1927 products was practically all sold as the 1928 season was approached, but the latter proved to be very disappointing. Cherries, bilberries, and strawberries did not come up to hopes, although raspberries were plentiful. The plum harvest was a very poor one in Central Germany, though not elsewhere. Apples were only fairly satisfactory; cherries were better. Whortleberries delivered in boxes were good in quality and quantity. Still, on the whole, the harvest of those fruits in which canners are interested, was a small one, the effect of which is bound to be felt in the industry. Firms of standing have ensured their supplies and prices are going up. The continually increasing importation of sub-tropical fruits under the motto "Eat more fruit" is not doing the fruit canners any good, and many complaints are heard about this needless spending of the Fatherland's money to the detriment of its own trade.

Vegetables

There was a good record of sales in canned vegetables for the end of the year. The tendency of canners is to confine themselves to the canning of fewer lines. In many cases, autumn vegetables are no longer canned at all, only asparagus, spinach, peas, mixed vegetables, and beans.

The construction of greenhouses with a view to keeping a supply of fresh vegetables is a new movement which is receiving much attention in Germany. Last year the Bavarian Ministry of Agriculture, in co-operation with the "Landesbaukammer," financed a tour of study in Holland with a view to the extension of this project. Berlin is also interested, and the entire estate of Damsdorf, 50 km. from the city, has been acquired for the same purpose. It is not expected that the canning industry will be affected.

The mushroom crop failed completely. Early in the year inquiries had been very numerous, but the bad-harvest clause stipulations in the advanced selling agreements, absolved the canners from any obligations. The Russian mushroom harvest was a good one, and large quantities have been going lately to Germany and the U.S.A. The consignments which are dried and in boxes are in good condition. They are mostly from White Russia and the Ukraine.

Jam

The jam industry is still suffering from a surfeit on the market of worthless jams which are selling for next to nothing. The demand for these is always great, but there are signs of a growing demand for jams of better quality. It was to meet this demand that the large firm began to use highly concentrated pectin for their products. The production of good-class jams is an easier matter than formerly. Pectin products are now to be had in many forms and of good quality. Some factories are using the rejected apple-parts for the extraction of pectin, and not a few firms are making other experiments in the same direction.

A good deal has been written and discussed about pectin recently. A maximum was recently put on the quantity to be used, which some consider too low.

It is becoming increasingly clear that better results are obtained by the use of several preservatives than with only one, this being due to the fact that different preservatives have different effects under similar conditions.

Towards the end of the year the sugar tax was raised—the home product remaining untouched. This has been hailed with acclamation all round.

Standardising Sizes

Recently a standard size for all canned vegetables was fixed, as also for fruit juices and other bottled goods. It is hoped to do the same for vegetable canning, and meat canning is said also to be interested.

As time goes on the lot of the small manufacturer is becoming more and more difficult. He finds it impossible to compete on anything like equal terms with the larger factories, who leave him only the smallest orders, which are not, as a rule, very profitable.

The Effects of Rationalisation

First the Co-operative Societies combined to form one large buying organisation, and these have now *their own preserving and canning factories*. Then large stores began to spring up everywhere, making a speciality of grocery wares, and latterly the better-class and more prosperous small grocers have formed themselves into co-operative buying organisations all over the country. One alone, in Chemnitz, represents over 300 retailers in this manner. All these "Grosseinkaufsgesellschaften" get their requirements supplied in single lots of enormous size from whoever quotes the best terms. As a rule the labels bear the buyer's name. Thus canners in a small way are squeezed out of the market.

Some of these combines have already begun to manufacture certain stock lines themselves, and it is only to be expected that they will soon be canning their own fruit and vegetables.

So that the outlook for the majority of those in the canning industry is not at the moment by any means bright.

The Vitamins of Commercially Concentrated Orange Juice*

THE PROBLEM of conserving the antiscorbutic potency of Citrus fruit juices has exercised the mind of investigators since the close of the war. Experimental work along these lines, principally in America and in England, has been carried out by the application of two chief processes, the spray process and the method of concentration in vacuo. In 1919, Givens and McClugage pointed out the numerous and obvious advantages that would follow if a satisfactory industrial method could be devised for the concentration of the vitamin C content of fruit juices.

Several different methods of supplying vitamin C for practical purposes have been suggested. Amongst these, mention may be made of the method of germination of pulse (Chick and Delf, 1919; Chick and Hume, 1917, 1, 2; Wiltshire, 1918); the canning of tomatoes (see *Medical Research Council's Report*, 1924); preservation of orange juice and lemon juice exposed to ordinary temperatures, by means of the rind oil (Davey, 1921); concentration of lemon juice in vacuo, with the addition of lactose and gum to form potent tablets (Bassett-Smith, 1920, 1921), and the use of dried orange juice and lemon juice powders (Merrell-Soule). There are, however, various objections to all these methods.

The most satisfactory method so far devised appears to be that of concentration of orange juice in vacuo at a low temperature. In this country Harden and Robinson (1919-1920, Robinson 1919), who appear to have been the first to introduce this method, showed that fruit juices may be dried without serious loss of antiscorbutic potency by evaporation in vacuo at 40°. Moreover, the dry residue from orange juice was found to retain some antiscorbutic principle after two years' storage over sulphuric acid at room temperature. On the other hand, Givens and McClugage (1921), employing the spray process, found dried orange juice to be still effective after 14-20 months. The spray process of drying orange juice has also been studied in detail by McClendon (1921) who devised a special apparatus. However, the experience of different investigators appears to show that the spray process is inferior to the vacuum process, in that it does not produce so satisfactory a product.

The work of Harden and Robinson has received ample confirmation. For example, Goss (1925), using concentrated California orange juice (identical with the product used in the present investigation), found that it retained practically all the original antiscorbutic potency. Hawk, Fishback, and Bergheim (1920), employing orange juice evaporated to dryness in vacuo, arrived at similar conclusions; whilst Priston (1926), in an exhaustive study carried out on behalf of the British Navy, substantially confirmed Goss's findings. The question of the preservation of the vitamin C content of different species of orange juice by large scale processes has also been considered by Delf (1921) in her study of some South African foodstuffs.

The problem of the survival of vitamins A and B known to be present in orange juice (Osborne and Mendel, 1920, 1921; Osborne, Mendel and Wakeman, 1920; Willmott, 1928) has received less attention. However, Osborne and Mendel showed that both these vitamins persisted in undiminished potency when orange juice was desiccated by concentration in vacuo in the laboratory. This important finding, together with the fact that the vitamin C in orange juice is more stable to high temperature than in other natural antiscorbutic products (Delf, 1920), justified the belief that vitamins A and B could also be retained intact in orange juice which had been commercially concentrated by the vacuum process. To investigate the validity of this supposition the experiments described were carried out on a concentrated product prepared from the same species of orange as that previously studied (Willmott, 1927-1928). From these it appears definite that, so far as our knowledge extends, the three vitamins (A, B, and C) known to be present in fresh California orange juice in appreciable amount, are preserved apparently without loss when concentrated by a carefully controlled industrial process of distillation in vacuo at low temperature. Such a concentrate, prepared under these conditions, is sterile, owing to the high osmotic pressure of the sugars present, and is of high bactericidal power (Priston, 1926). It also appears to keep well over long periods (Priston, 1926, 1; Humphrey, 1926). However, when the concentrated product is diluted to the strength of raw orange juice it ferments on standing for a few days, and moulds and bacteria can then be readily grown. Because of its sugar content, the energy value of the concentrate appears to be high. The slightly bitter taste sometimes observed in such concentrates is probably due to the presence of the bitter glucosides sometimes found in the orange.

These constituents appear worthy of further study, especially as their presence in concentrates may affect the flavour. The pigments of the orange are also deserving of further investigation (Palmer, 1922). Other important constituents are the basic mineral matter present in orange juice, which is retained intact in concentrates derived from it (see Chaney and Blunt, 1925) and the protein (Smith, 1925).

* Willimott, *Biochemical Jour.*, 1928, vol. 22, pp. 535-542, and *Perfumery and Essential Oil Record*, July, 1928, pp. 261-262.

Recipes

The Art of Sugar Spinning

IN THE spinning of sugar, like everything else, the way to proficiency only lies through perseverence in making the necessary experiments, but once, through patience and practice, this perfection is achieved, it will prove well worth while, for it is instrumental in obtaining some of the best ornamental effects in confectionery.

A most important element of success in this useful kind of decoration is the choice of the best sugar; a poor quality will darken by the time it reaches the temperature required. Another is that the copper boiling pan must be bright and clean. The boiling should be done as quickly as possible in order to retain the colour, no matter what the quality of the sugar used.

The work should be carried out in very small lots of about 3½ lbs.

Take

3½ lbs. best granulated sugar.
¾ drm. cream of tartar.
1½ pints water.

Place the sugar and water in a clean copper pan, set on the gas or fire, and stir until it comes to the boil; take a fine skimmer and remove the scum that has risen to the surface of the molten syrup. Now set on to boil again, then add the cream of tartar. Wipe the sides of the pan to remove any adhering syrup, put in the thermometer, and allow to boil until the thermometer registers 310° F., when remove immediately from the fire.

There are several kinds of spinners, but one of the best devices is a kind of one-way whisk with a removable jacket of tin to prevent any of the fine silken strands straying round the walls or the floor of the workroom. This tin jacket is slightly oiled and a spoon is now used. Fill it with the syrup and pour in a fine stream on the revolving whisk until you have sufficient for the mould intended for use. Should any colours be needed, add them when the batch is at 295° F. (The more variations of colour for this work the greater is the attraction given.)

For the basket or whatever the subject is, use the same mixing as for the spun sugar, and cook this to 290° F., and colour as desired when 280° F.

Now have an oiled slab bearing a drawing of basket net-work. From a small spout at the end of the boiling pan pour in a fine stream over the tracing made. When nearly cold lift gently, and with a slow bending of the sugar (not too quickly or it will break) join them together and stick the ends together with a little of the molten sugar. The handle is made in a similar manner. Take strands of spun sugar and place them in the basket, but shaped previously to fit in. All kinds of candies, liqueur drops, marzipan fruits, flowers, and bon-bons, etc., might be introduced with taste and discrimination, and tend very considerably to enhance the elegance and beauty of the ornaments and designs essential to this style of confectionery.

These additions may be sunk in the spun sugar while it is soft or placed on the top afterwards when finished. It is a mistake to suppose that ornaments on baskets, vases, etc., of spun sugar will serve only once; by keeping them in a dry atmosphere, or in an airtight globe, they remain serviceable for several days.

This kind of confectionery is lacking very much on this side of the Channel, but on the Continent it takes pride of place for decoration on the tables of the chief hotels. Cups, tazzas, vases, ships, bird-cages, etc., are generally spun or traced upon copper or tin moulds rubbed with a little oil, the sugar being spun or traced either with the point of a dessert spoon or with a pointed round stick. The moulds should have a tube permanently fastened inside the bottom, admitting of a round wooden handle being inserted, this enabling the operator to hold the mould conveniently in his left hand so as to turn it about in any direction in tracing the caramel on the designs. The foot or foundation of the basket or vase should be made separately, as also the several parts of any more complicated object. When the stick or spoon is dipped into the cooked sugar, allow all excess of sugar to run off until you find it runs in an even, thick thread. Then begin to trace out the design. When the sugar has set, gently remove from the mould and then fasten on the handles or any other ornaments required to finish it off.

Oatmeal Dainties

By C. McLEAN

Oatmeal Bread

Mix together in a basin one pound fine oatmeal, one pound of flour, and two tablespoonfuls salt. Dissolve two ounces sugar in one breakfastcupful hot milk; allow to cool slightly, then add one heaped tablespoonful fresh yeast and stir well. Make a well in the centre of the oatmeal mixture, stirring all the time. Sprinkle with flour, cover with a cloth, and leave in a warm place for an hour or so to "set the sponge." Remove from the basin, knead well on a floured board, place in tins, and bake in a hot oven for one hour.

Oatmeal Parkins

Place in a saucepan half pound treacle, three ounces butter, and one ounce sugar. Then draw close enough to the fire to allow the mixture to melt without burning. Mix in a bowl half pound fine oatmeal, two ounces flour, and one teaspoonful ground ginger. Make a well in the centre and slowly pour in the treacle mixture, stirring all the time. Dissolve one teaspoonful baking soda in two table-

spoonfuls milk, and stir into the mixture. Place in a well-greased baking tin and bake in a moderate oven for one hour.

Oatmeal and Meat Pudding

Boil four ounces rice in one pint of water for ten minutes, then drain off the liquid. Rub one ounce dripping into two ounces oatmeal, add one ounce chopped suet, one small onion (finely chopped), and a little chopped parsley and half pound minced steak. Mix well. Mix with the rice, add one cupful brown stock, one teaspoonful ketchup, and a pinch each of salt and pepper. Mix well. Pour into a well-greased basin, cover with greased paper, and steam for two hours. Serve with a sauce made as follows: Mix one ounce each of melted butter and flour in a saucepan. Simmer for five minutes, then slowly add one cupful hot stock, stirring all the time. Pour this over the pudding and serve as hot as possible.

Clear Mint Toffee

(*Reply to Enquiry No.* 42.)

Boil in small batches, say:

14 lbs. sugar crystals.
2 quarts water.
½ oz. powdered cream of tartar.
2 drachms oil of peppermint.

Boil the sugar and the cream of tartar with the water, steam down sides of pan for five minutes to insure that there is no crystallising, then boil up to 305° F.

Raise the pan from the fire and gently stir in the oil of peppermint, then pour on to a slab, and when cool enough, mark off into pieces of the size required. It is important to bring up to 305° F. as quickly as possible and to cool off quickly.

To insure a white clearness of the sweet, the best pan to use is an aluminium one, as the verdigris from copper tends to discoloration. Usually the toffee is poured on to a water-cooled table and cutters are then pressed in to cut the toffee into pieces 1 in. by ½ in.

(From the Aluminium Plant and Vessel Company, Limited, Wandsworth, London, S.W. 18, who supply the utensils required.)

Enquiries

43. One of our subscribers writes as follows:

"I shall be indeed grateful if you could send, when convenient, the best recipe you can find for a Butcher's Beef Sausage."

44. Required: Makers of a Dextrinised Wheat Flour.

Trade News

THE *Thomas Hill Engineering Company (Hull), Limited*, has been registered and has acquired from January 1, 1929, the Business of "Thomas Hill, of Hull," who have specialised for many years in the manufacture of bottle cleaning machinery and appliances.

The business was founded in 1884, and has a worldwide renown in the bottling trade as makers of sound and reliable bottle cleaning machines. Greatly increased facilities have now been provided for meeting the increasing demand for the productions of "Thomas Hill."

The business is being conducted in an enterprising manner, and the numerous modern productions of this house will, we feel certain, be appreciated by bottlers, especially those having a practical knowledge of the trade. A new catalogue has been produced, which contains a great deal of practical information and advice on the subject of bottle cleaning, and we can advise our readers to procure a copy from the address below.

The only shareholders and directors of this new company are Mr. T. E. Hill (chairman), Mr. G. F. Hill, and Mr. J. C. Hill, who have previously been responsible for the management of the business.

The registered offices of the company are 247, Beverley Road, Hull, Yorks.

* * *

A brochure, relating to valves made from solid drop forgings for services up to 500 lbs. per sq. inch working pressure of steam, has been received from Gummers, Limited, of Rotherham. It illustrates the valves in section, and gives their dimensions.

* * *

The January issue of the *Arkady Review*, which is the organ of British Arkady, Limited, Old Trafford, Manchester, contains some interesting contributions, including "Yield and Yeast," "The Story of Flour," and "The Colloid Chemistry of Bread Making."

* * *

The Seventh London Baking Trade Exhibition is to be held at the New Royal Horticultural Hall, Westminster, on March 5, 6, and 7.

* * *

Messrs. Boake, Roberts and Company, Limited, of Stratford, London, E. 15, have issued a new price list in attractive form, which also contains a scale of fees charged for chemical and physical analysis.

* * *

Two pamphlets recently issued by Sulzer Bros., of 31, Bedford Square, W.C. 1, on Refrigerating Plant for Small Installations, should be of interest to hotel proprietors, butchers, and hospitals, etc.

* * *

It is usually assumed that the more advertising matter there is on a calendar the less artistic it can be. That this is not so has been proved. The 1929 calendar of Mather Bros., power and electric light

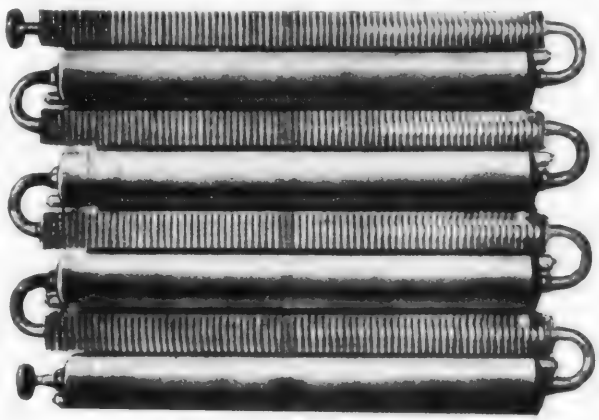
ing engineers, of Farringdon Street, E.C. 4, although crammed with advertising matter, is a perfect delight to the eye. The colours used are violet and gold, and a movable device helps to spot the date at once. A thing of beauty is a joy for ever, but there is a peculiar felicity about a combination of beauty and utility which, to our minds, pure beauty does not possess.

* * *

A useful pamphlet on "Unfair Competition," by Mr. R. M. Leonard, the Secretary of the Federation of Food Manufacturers, was recently published.

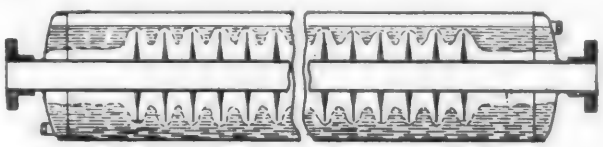
* * *

The *Favier Accumulator-Regulator* is an apparatus for insuring constant temperature and moisture condition in the cold store. This is, of course, an extremely important matter in the preservation of food-



A Refrigerating Set, made up partly of Favier Accumulator-Regulators, and partly of Favier Standard Gilled Pipes.

stuffs. The Favier Regulator consists of (1) a cylinder which is partly filled with a liquid of well-determined freezing point. (2) a Favier gilled pipe passing through the cylinder. Inside the pipe is circulated the freezing solution. The liquid freezes around the gills and the ice so formed melts, when



A Section of a Favier Accumulator-Regulator showing the Freezing Zone around the Gills.

the machine is stopped, and restores the cold accumulated during operation. As the mass of liquid used is small, the Favier Accumulator-Regulator reaches the selected temperature as soon as the machine is started and maintains this temperature as long as desired.

* * *

(*Continued from page* 49.)

to mouth buying, according to information recently received from the American Trade Commissioner at Shanghai. Towards the close of the year however, orders have increased on account of rumours concerning impending tariff changes to be enacted by the new Nationalist Government in February.

Nova Scotia Pack of Canned Fruits and Vegetables

While no statistics are available on the production of canned fruits and vegetables in Nova Scotia during the season of 1928, it has been learned from interviews with Provincial officials and wholesalers in Halifax that roughly the following amounts were produced, according to a report of October 1 from American Vice-Consul J. P. Ragland at Halifax:

Fruits.	*Cases of 24 No. 2 Tins.*
Strawberries	1,400
Pears	500
Raspberries	100
Blueberries	(No estimate but only a few cases)
Apples	(Season just beginning)

Vegetables.	*Cases of 24 No. 2 Tins.*
String beans, wax, & green	6,000
Baked beans	5,000
Peas	2,000
*Pumpkins	500
Cauliflower	(Experimentally)

* No. 2½ Tins.

In addition to the above, blueberries, foxberries, raspberries, and strawberries are made in jams. Foxberries are exported in barrel lots.

There is practically no stock of the local markets carried over. Wholesalers are said to carry unusually light stocks of tinned goods imported from Ontario and abroad. No figures are available on the exact amount held at present.

The canning of fruits and vegetables is a minor industry in Nova Scotia hitherto confined principally to apples, and the industry, therefore, is governed by the apple crop. In years having a surplus of apples, the industry has been active. The indications are that the present apple crop will be below normal and that the industry will, in general, suffer. It has been roughly estimated that last season as many as 20,000 cases of 6 one-gallon tins of apples were produced. However, the industry is increasing in other lines. Until this season peas were only put up experimentally. Now the product is reaching commercial quantities. The same is true of wax beans and baked beans. The *Halifax Chronicle* of September 27, 1928, reports that 2,500 tins of string beans were produced this season at a lobster cannery at Meteghan, Nova Scotia. In 1927, 1,350 were produced, and in 1926 only 400. The quality of the several local products is said to be good, and the extraordinary complaint was made that a Nova Scotia baked bean product contains too much pork. Apart from the anticipated shortage of apples, which is, of course, serious for the major part of the Nova Scotia fruit canning industry, there appears to be no marked change in the cost of labour or other raw materials.

Overseas News

The Australian Market

THE FOLLOWING has been abstracted from the American *Commerce Reports*.

"Australia is an important market for the sale of American pickles and relishes. Its position as fourth most important purchaser of American pickles has been maintained during the past four years, while in 1927 it rose from eighth to seventh place among the ten most important markets for condimental sauces and relishes. The largest market is for mixed pickles, but sweet pickles and pickled onions also register fair sales.

"United States exports of sauces and relishes to Australia have decreased somewhat during the past three years, despite that country's improvement in relative importance as a market for the American products. There is an increasing demand for mayonnaise and salad dressings in Australia, and the local trade feels that such condiments of American manufacture should find a market there, if they are equal to the local and the European products in price and quality, and are given proper distribution and sufficient advertising.

"China has been an important buyer of pickles from the United States during recent years, ranking sixth in importance in 1927. Imported pickles are sold principally to the foreign population, the native preferring the varieties of pickles manufactured in the domestic market—principally pickled beans, cucumbers, and onions. These sell at prices far below the imported products, the scale of prices being so widely divergent that the products of the two sources are very seldom found in the same channels of trade. It is not expected that the demand for American pickles in China will be materially increased in the near future.

"The sale of American ketchups and tomato sauces is relatively important in China when it is considered that that country ranked fourth in importance as a market for these products of American manufacture in 1927. The products are used not only by the foreign population in the large cities, but have become popular with the more wealthy Chinese families in the important trading centres. Salad dressings and mayonnaise, however, have not yet become popular with Chinese whose purchasing power would be sufficient to warrant the purchase of such condiments."

Market in Ethiopia

According to a report of the Washington Chamber of Commerce there is a large market for canned and dried fruits in Ethiopia.

Large Dried Fruit Crops Expected in Australia in 1929

The latest report from Mildura (Victoria)—where one half of the acreage in Australia under drying fruits is situated—indicate that the 1929 season promises to be an excellent one. Currants and sultanas are showing good crops, and growers generally appear to be calculating on a tonnage to equal the 1927 one. Seasonal conditions have been very satisfactory and the vines are showing good growth, being free from all signs of disease.

According to indications, it is expected that the crop of prunes for the coming season, especially in New South Wales, will be larger than usual. It is now estimated that the coming season's production in that State, supplemented by that of other fruit-growing States, will be sufficient to supply the whole need of the Commonwealth in this fruit. A preliminary unofficial statement estimated that the crop in New South Wales will be 3,000 tons, and 1,000 tons for all the other States combined. Consignments of prunes are arriving from California, and it is possible that fruit-growers may ask the Commonwealth authorities to place a heavy duty on foreign fruit.

Decree Providing for Pasteurisation of Milk in Mexico

A decree has been issued by the Governor of the State of Puebla, providing for the pasteurisation of all milk sold in that State, according to information received from A. F. Nufer, Mexico City.

In view of the fact that the Department of Agriculture has recently declared the only large pasteurisation plant in Puebla as obsolete and not satisfactory for service, some difficulties are anticipated in the carrying out of this order.

It is also unofficially reported that a presidential decree will shortly be issued providing for the pasteurisation or certification of all milk sold throughout the Republic. At the present time this regulation is in force only in the Federal District, and, if the presidential decree is issued, it would, of course, greatly enhance the sale of pasteurising equipment in Mexico.

Formation of a French Syndicate of Foodstuffs Importers

There was recently formed a syndicate of French importers of foodstuffs, with headquarters in Paris, of which the principal object is to secure the enactment of legislation designed to prevent exporters from falsifying the quality of food products imported into France, according to information received in the Department of Commerce by American Trade Commissioner W. L. Finger, at Paris, France. Some prominent importers contend that many foreign food products entering France, especially canned goods, carry misleading or absolutely false statements on the labels in regard to the quality of the product.

Although the syndicate is composed mainly of French members it has the hearty approval of the Paris representatives of several large American exporters of foodstuffs.

New Brunswick Clam Industry

In New Brunswick increased interest is being shown in the clam industry. Local tastes have not hitherto compelled the exploitation of this particular type of sea food, but canning methods are being perfected, and to-day large shipments are sent to United States markets. Most canning establishments are operated in conjunction with lobster or fish preserving, but now a number of small plants are devoting their entire activities to the canning of clams. There has been a better local demand for fresh clams during the past year, especially on the part of tourists.

Latvian Canned Fish Exports

The fish canning industry which has been carried on in Latvia for many years is now rapidly recovering from the effects of the war, according to information received from L. C. Morse, at Riga, Latvia. Exports during the past three years were as follows:

Year.	*Short Tons.*	*£.*
1925	180	24,000
1926	317	51,000
1927	569	105,000

The chief countries importing Latvian canned fish in order of their importance are: The United States, Germany, France, Czechoslovakia, Great Britain, Lithuania, and Soviet Russia, and efforts are being made to expand the market to include the Balkan States, South America, and the Far East.

The Riga canning industry alone put on the market, before the war, goods valued at approximately £500,000.

Canned Fruits and Vegetables in Chile

It is estimated by the trade that there were 100,000 cases of peaches canned in Chile from the 1927 crop. Most of these cases contained 48 tins of 30 oz. each. Of all the other fruits mentioned below an estimate places the total number of cases at 6,000. These cases also contain 48 tins of 30 oz. each.

With the exception of peaches, when the 1927 crop was packed there was stock remaining from previous years of all the fruits which are canned in Chile, principal among which are cherries, grapes, quinces, prunes, pears, apples, and strawberries.

The exportation of canned fruit is very small, because practically the total amount produced is consumed within the country. Chilean exports of canned fruits for the year 1928 will be shown for the first time under a separate heading. According to information obtained from official sources, during the first six months of the present year, canned fruits amounting to 324,742 pounds, with a value of £3,800, were exported.

While no information is available as to the destination of these exports, it is believed that the greater part went to the more northern countries of the West Coast of South America, Peru, Ecuador, and Colombia.

The principal vegetables canned are petit pois, tomatoes, split peas, string beans, corn, and asparagus. From information obtained from the trade consulted on this matter, it is believed that annual production is approximately 20,000 cases petit pois, 5,000 cases tomatoes, and considerably less of the remainder of those listed. Petit pois are packed 48 tins to the case, each containing 17·5 oz., while a case of tomatoes contains 48 tins of 30 oz. each.

About the only time when the prices of canned vegetables are liable to fluctuations is when the new crop is put on the market. A great part of the fruits and vegetables canned by some of the best known packers is grown in their own orchards and gardens for that purpose.

Canners usually employ agents for the disposal of their products, and these agents frequently buy supplies for them such as tinplate, sugar, boxes, etc. In addition, agents advance funds for supplies needed and expenses incurred, and the interest rates charged for this service increase the prices of the canned products accordingly.

The Municipality of Santiago is at present studying the pure food laws with a view to their revision, and it is anticipated that new laws on this subject will be passed some time within the next three or four months.

Preliminary Reports Indicate Record Salmon Pack for British Columbia

Salmon fishing in British Columbia waters terminated on November 21 with the closing of the season, and will remain so until the Deputy Minister of Fisheries sees fit to open it. Up to November 3 the season's pack was 1,934,554 cases. In 1926, the record year, up to October 30, 1,894,981 cases were packed. The figure for 1927, to October 29, was 1,271,793. The total pack for 1925 was 1,720,620 and 1924 1,747,505 cases.

This seems to indicate a new record this year, but as the figures are only preliminary, the final reports may vary the total somewhat. The sockeye pack this year was about 90,000 cases below last season, but pinks, 763,168 cases, showed an increase of 525,559, while the chums, 802,453, showed a gain of 292,269 cases.

Reports from cold storage plants show a better than normal pack of frozen fish, and fresh fish demand has been kept fully supplied all season at a slightly lower price than last year.

Dry Ginger Ale Development

It is understood that following the visit of Mr. J. C. Goff, chairman of Crosse and Blackwell, to America, an arrangement has been entered into with the Canada Dry Ginger Ale Inc. for the developing of that company's products in this country.

The Canada Dry Ginger Ale Company is an American undertaking manufacturing a number of non-alcoholic beverages at plants situated in five centres in America and Canada, while it has also acquired the business of other companies in the same line of business.

China Canned Foods Market during 1928

The market for imported canned goods throughout 1927 was characterized for the greater part by hand

(*Continued on page* 47.)

Commercial and Legal News

(The Editor does not accept responsibility for any errors which may occur in the following notices.)

New Companies

The undermentioned particulars of New Companies recently registered are taken from the Daily Register compiled by Jordan and Sons, Limited, Company Registration Agents, 116-118, Chancery Lane, London, W.C. 2.

BLAZE, ALLOTT AND COMPANY, LIMITED. (235413) Regd. December 7, 1928. To take over the businesses of bakers and confectioners cd. on at Lincoln by Blaze and Son, and Allott and Company. Nom. Cap.: £17,000 in £1 shares (5,000 pref. and 12,000 ord.).

J. E. MASON, BRETT AND BENEY, LIMITED. (235427) Regd. December 7, 1928. 88-90, Chancery Lane, W.C. 2. To carry on the bus. of wholesale, retail, and genl. bakers, etc. Nom. Cap.: £2,000 in £1 shares (1,000 "A" and 1,000 "B").

TIVOLI CONFECTIONERY COMPANY, LIMITED. (235442) Regd. December 7, 1928. Wick Lane, Wickford, Essex. To take over the bus. of confectionery mnfrs. cd. on at Wickford, as the Tivoli Confectionery Company. Nom. Cap.: £1,000 in £1 shares (500 pref. and 500 ord.).

EDGAR ELLIS, LIMITED. (235454) Registered December 8, 1928. 44, Tower Street, Harrogate. To carry on the bus. of grocers, provision mchts., etc. Nom. Cap.: £5,000 in £1 shares (4,900 pref. and 100 ord.).

H. AND E. KING, LIMITED. (235457) Regd. December 8, 1928. 104, Stroud Green Road, Finsbury Park, N. 4. To carry on the bus. of bakers, confectioners, caterers, etc., as cd. on at Stroud Green Road, by H. King. Nom. Cap.: £2,500 in £1 shares.

JOHN PETTIT AND SONS, LIMITED. (235461) Regd. December 8, 1928. To carry on the bus of wholesale and retail butchers, bakers, confectioners, grocers, etc. Nom. Cap.: £1,500 in £1 shares.

C. OSBORN AND COMPANY, LIMITED. (235476) Regd. December 8, 1928. To carry on the bus. of potted meat and fish mnfrs. cd. on at 1, Spenser Road, Stoke Newington, N., by A. N. Osborn and G. Osborn. Nom. Cap.: £30,000 in £1 shares.

COLBECKS, LIMITED. (235488) Regd. December 10, 1928. 7, Fountain Street, Morley, Yorks. To take over the bus. of bakers and confectioners cd. on at Morley and Gildersome, Yorks, by M. Colbeck and Mary E. Brook. Nom. Cap.: £2,500 in £1 shares.

CLARK ANSTED AND COMPANY, LIMITED. (235528) Regd. December 12, 1928. 19, Eastcheap, E.C. 3. To take over the bus. of a dried fruit broker cd. on at Eastcheap as "Clark Ansted and Company." Nom. Cap.: £2,000 in £1 shares.

JOHN DORY, LIMITED. (235539) Regd. December 12, 1928. 21, Cheriton Place, Folkestone. To carry on the bus. of wholesale and retail dlrs. in fish, meat, poultry and game, etc. Nom. Cap.: £4,000 in £1 shares.

T. BIDDULPH AND SON, LIMITED. (235550) Regd. December 12, 1928. 60, Mason Street, Liverpool. To carry on the bus. of mnfg. confectioners, etc. Nom. Cap.: £10,000 in £1 shares (1 life governor's).

J. WOLSEY AND SON, LIMITED. (235597) Regd. December 14, 1928. To take over the bus. of wholesale and retail fruit and vegetable mchts. cd. on at 1, Knowles Street, or elsewhere in Stockton-on-Tees, as "J. Wolsey and Son." Nom. Cap.: £15,000 in £1 shares.

KIPLINGS (BUSHEY), LIMITED. (235598) Regd. December 14, 1928. Kipling's Stores, 89, Herne Road, Bushey, Herts. To carry on the bus. of grocers, provision mchts., and confectioners, etc. Nom. Cap.: £1,000 in £1 shares.

PAYANTAKE STORES, LIMITED. (235643) Regd. December 15, 1928. 137, Upper Street, Islington, N. To carry on the bus. of grocers and provision dlrs., etc. Nom. Cap.: £5,000 in £1 shares.

COUNTRY FOODS, LIMITED. (235648) Regd. December 15, 1928. To take over the bus. cd. on at The Thames Valley Bee Farm, Teddington, as "The Thames Valley Bees." Nom. Cap.: £1,300 in 1/- shares.

ASSOCIATED GROCERS' WHOLESALE, LIMITED. (235651) Regd. December 17, 1928. To carry on the bus. of wholesale grocers and provision mchts., mnfg. grocers and Italian warehousemen, etc. Nom. Cap.: £10,000 in £1 shares. Minimum subsn.: £2,000.

HINTON AND HOOPER, LIMITED. (235712) Regd. December 19, 1928. To take over the bus. of a banana and fruit mcht. cd. on at Bow Street, Spitalfields Market, and Borough Market, as "Hinton and Hooper, Limited." Nom. Cap.: £5,000 in £1 shares.

BLACKPOOL CONFECTIONERY COMPANY, LIMITED. (235767) Regd. December 20, 1928. To carry on the bus. indicated by the title. Nom. Cap.: £1,000 in £1 shares.

ROBERT WEATHERLEY AND SONS, LIMITED. (235780) Regd. December 20, 1928. 13-14, Holywell Row, Worship Street, E.C. To carry on the bus. of wholesale and retail grocers, etc. Nom. Cap.: £500 in £1 shares.

FARM COMMODITIES, LIMITED. (235801) Regd. December 21, 1928. 532, High Road, Streatham, S.W. 16. To carry on the bus. of wholesale and retail dlrs. in and purveyors of eggs, butter, cream, and milk, etc. Nom. Cap.: £1,000 in £1 shares.

J. F. RHODES AND SONS, LIMITED. (235805) Regd. December 21, 1928. 54, Kirkgate, Bradford. To take over the bus. of grocers and provision mchts. cd. on at 54, Kirkgate, 311, Legrams Lane, Lidget Green, and 2 and 4, Heidelberg Road, all in Bradford, and 36, Upperhead Row, Leeds, as "J. F. Rhodes and Sons." Nom. Cap.: £27,500 in £1 shares.

London Gazette Information

Joint Stock Companies.

At the expiration of three months the names of the under-mentioned companies will, unless cause is shown to the contrary, be struck off the Register, and the companies will be dissolved:

English Concentrated Produce, Limited.
Grocers' Alliance Company (London), Limited.
Meatmaco Products, Limited.
Mozambique Sugar Development Company, Limited.
Sandow's Cocoa and Chocolate Company, Limited.
V. P. Vinegar Company, Limited.

Merchandise Marks Act, 1926.

The Counsellors of State by and with the advice of H.M. Most Honourable Privy Council were pleased on December 21, 1928, to approve Orders in Council under the above-named Act, entitled the "Merchandise Marks (Imported Goods) No. 4 Order, 1928," the "Merchandise Marks (Imported Goods) No. 5 Order, 1928." Copies of the Orders, when published, may be purchased directly from H.M. Stationery Office, or through any bookseller.

MERCHANDISE MARKS ACT, 1926.

IMPORTED TOMATOES.

It is announced that an application for an Order in Council under the above-mentioned Act to require the marking of imported tomatoes in their fresh or raw state with an indication of origin has been referred for inquiry to the Standing Committee set up under the Act by the Minister of Agriculture and Fisheries, the Secretary of State for the Home Department and the Secretary of State for Scotland, acting jointly.

Attention is called to the fact that, under the provisions of the Act, while the Committee in every case referred to them must consider whether the goods should bear the indication of origin at the time of sale or exposure for sale, they may also, at their discretion, consider and report upon the question whether such goods should bear an indication of origin at the time of importation.

The date of the inquiry will be announced later. Any communication with regard to the matter should, however, be addressed, as early as possible, to Mr. H. J. Johns, the Secretary of the Standing Committee, 10, Whitehall Place, London, S.W. 1.

Voluntary Liquidations.

(Note.—Voluntary liquidations may, in some instances, refer to companies in course of reconstruction.)

NANTWICH COCOA HOUSE COMPANY, LIMITED. Resolved, December 6, 1928, that the company be wound up voluntarily, and that Mr. Geo. H. Harding be appointed liquidator.

TENBURY WELLS AERATED WATER COMPANY, LIMITED. Resolved, December 22, 1928, that the company be wound up voluntarily, and that Mr. F. S. Miles, Solicitor, Tenbury, be appointed liquidator.

THE CLEVELAND FLOUR MILLS, LIMITED. Resolved, December 27, 1928, that the company be wound up voluntarily; that Mr. E. Hunter, C.A., of Royal Exchange, Middlesbrough, be appointed liquidator for the purpose of the voluntary winding-up, and to carry into effect an Agreement dated September 24, 1928, as adopted and ratified by the company at the Extraordinary General Meeting held on October 4, 1928.

Partnerships Dissolved.

F. D. BAVERSTOCK AND COMPANY (F. D. Baverstock, T. W. Brown, and A. J. Greeves), Canned Goods, Dried Fruits, and General Produce Brokers, Shanghai House, 8, Botolph Lane, Eastcheap, E.C., and 41, North John Street, Liverpool. Mutual dissolution December 31, 1928. Debts by F. D. Baverstock and T. W. Brown, who continue the business under the same style.

ARMAY AND COMPANY (W. H. Armstrong, J. Haynes, and W. H. Chapman, Junior), Chemists Sundries, Sauce and Cordial Manufacturers, 30, Prescot Road, Knotty Ash, Liverpool. Mutual dissolution as from January 9, 1929. Debts by W. H. Armstrong and J. Haynes, who continue the business under the same style.

Legal News

The Editor and Proprietors of FOOD MANUFACTURE *do not accept responsibility for any errors which may occur in the following Law Reports.*

ARSENIC IN BAKING POWDER

An appeal with regard to the arsenical content in baking powder was heard before Justices Shearman and Acton in a King's Bench Divisional Court on January 16, when Messrs. Smith, Hughes and Company, Limited, chemical manufacturers, of College Hill, E.C. 4, appealed from a decision of Judge Moore at Southwark County Court in favour of Mr. John Simons, a baking powder manufacturer, of Leroy Street, S.E.

Sir W. Schwabe, K.C., for Messrs. Smith, Hughes and Company, asked for a new trial, and said that fresh evidence had emerged since the hearing of the case at the county court.

The appeal arose out of an action in which Mr. Simons claimed and recovered damages from the appellants for £76 for being supplied with acid calcium phosphate, the arsenical content of which was above the average.

Messrs. Smith, Hughes, said counsel, warranted the a.c.p. as being of a certain quality which complied with the Food and Drugs Act and all other

requirements relating to the sale of food. It was alleged that there was a breach of contract by reason of the a.c.p. containing an excessive amount of arsenic.

Mr. Simons, it appeared, used the a.c.p. he received from Messrs. Smith, Hughes, in the manufacture of baking powder, which was sold to a grocer who was subsequently summoned and fined for selling baking powder which contained an undue quantity of arsenic. Mr. Simons paid the man's fine and costs, and destroyed the balance of the baking powder. He then claimed and recovered damages from the appellants.

After considerable argument, Mr. Justice Shearman intimated that he would like to hear Mr. Fox Andrews, who appeared for the respondent, only on the application for a new trial.

Giving judgment, Mr. Justice Shearman said he was not satisfied that the fresh evidence was not available at the time of the original trial. His lordship thought that the county court judge took the view that even if he had heard this new evidence his decision in the case would have been the same. His lordship was therefore not satisfied that the county court judge misdirected himself.

Mr. Justice Acton agreed.

The appeal was therefore dismissed, with costs. Leave to appeal further on the question of a new trial was refused.

Adulteration and Food Preservatives

At Leeds, last year, fourteen samples of dried peas were submitted for analysis, and in each case crystallised copper sulphate was reported as being present in quantities varying from 0·1 grn. to 0·2 grn. per pound. In his annual report, Dr. Johnstone Jervis said that legal proceedings were instituted in three cases, and two were dismissed on the same day under the Probationers' Act on payment of costs. The defence put forward was that not only was it impracticable to "add" any preservative to dried peas, but also impossible, and what copper sulphate there was present had been acquired naturally during growth. In view of this statement, expert opinion was obtained, which supported the contention that, in vegetables, including peas grown in certain prepared ground, copper exists. These cases were responsible for a circular letter drawing attention "to the fact that traces of some of the prohibited preservatives and colouring matters are naturally present in certain foods—*e.g.*, boric acid and benzoic acid in some fruits, and copper in peas and other vegetables. The quantities so present are usually insignificant, being much less than those which would be required for effective preservation or artificial colouring. What the regulations prohibit is the importation, manufacture, or sale of articles of food containing 'added' preservative or colouring matter." It would be well to bear these statements in mind before taking action.—*Municipal Engineering.*

The Food and Drugs (Adulteration) Act, 1928

This Act came into operation on January 1, 1929. It should be emphasised that the Act is a consolidating one only, and it is not intended to make any change in the law relating to the sale of food and drugs. It is in effect merely a re-enactment of the Sale of Food and Drugs Act, 1875, and the various amending statutes in which this subject was previously dealt with, and the collection of the requirements of the law into one composite Act should prove an advantage to all those who are required to make themselves familiar with this subject. "*The Grocer* Handbook and Diary" for 1929 contains the full text of the Act and the Schedules, and the notes to the earlier Acts which were contained in the Diary in previous years have been revised and brought up to date and included in their appropriate places for the purpose of explanation of the effect of the various Sections of the new Act. These notes contain references to a number of cases which were dealt with by the Courts under the old Acts, and the effect of the judgments in these cases will be equally applicable to the provisions of the new Act. In some cases, however, there is an alteration in phraseology which has led to the assumption that the law has been altered. This is not so, and the alteration in the form of words has only been made for the purposes of making more clear the provisions which were contained in the earlier Acts. The recorded cases will therefore be available as references for the purpose of interpretation of the 1928 Act. The general requirements relating to the sale of food and drugs are contained in Part 1 of the Act, and Section 6 of the Act of 1875 relative to the sale of an article to the prejudice of the purchaser has been reproduced in Section 2 of the new Act. It will, therefore, be under this Section that all proceedings will be taken where it is alleged that the article sold is not of the nature, substance, and quality of the article demanded by the purchaser. It is important to notice in connection with this Section and also with Section 1, which deals with the sale of an article which is injurious to health, that if the foreign ingredient complained of is a preservative or colouring matter, no offence is committed under the Food and Drugs Act if the article complies with the Public Health (Preservatives, etc., in Food) Regulations. If, on the other hand, the article contains preservative or colouring matter prohibited by the Regulations or an excess of the quantity prescribed, proceedings may be taken either under the Regulations or under the Act.

As another step towards the simplification of the law relating to the sale of food and drugs, the Ministry of Health have prepared the Public Health (Preservatives, etc., in Food) Regulations in a consolidated form, giving effect to the two series of amendments which were made to the original Regulations.

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Fruit and Vegetable Products

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53. Influence of Malic Acid in Lemon Juice on Warington's Method of Analysis. F. Perciabosco. (*Atti. II. Cong. Naz. Chim. Pura Appl.*, 1926, 1369-1370; *Chem. Zentr.*, 1928, i, 2191.)

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55. The use of Salad Oils in the Mayonnaise Industry. D. Wesson. (*Glass Packer*, 1928, December, 79-80.)

56. United States Foreign Trade in Pickles, Sauces, and Salad Dressings. J. R. Scully. (U.S.A. Dept. of Commerce, 1928, 51, 767-770.)

Cereal Products

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58. Evaluation of Flour by Iodine Solution. T. Chrzaszcz and W. Michalski. (*Przemysl Chem.*, 1928, 12, 342-349.)

59. Correlation of Ash content of Wheat and of Flour. R. C. Sherwood and C. H. Bailey. (*Cereal Chem.*, 5, 437-444.)

60. Determination of Hydrogen-Ion Concentration of Flour-Water Mixtures. P. Halton and E. A. Fisher. (*Cereal Chem.*, 5, 445-460.)

61. The Dicarboxylic Amino Acid Fraction in Gliadin. D. Breese Jones and Russell Wilson. (*Cereal Chem.*, 5, 473-477.)

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69. The United Kingdom Markets for Butter and Cheese. (*Canadian Export Pioneer*, December-January, 1928-29, 10, 99.)

70. Preventing Feed Flavours and Odours in Milk. (U.S.A. Dept. of Agriculture, Washington, D.C.)

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Books Reviewed

Das Wesen der Dürre. Ihre Ursache und Verhütung. Rotmistroff. Dresden, Verlag Steinkopff.

The appearance of this German translation of Professor Rotmistroff's important book two years ago created some very favourable comment in Germany, where it was admitted that a comprehensive work on the combating of drought conditions had so far been lacking. Although the author is concerned principally with conditions in the Ukraine, where the effects of drought are more often felt than in our own moister climate, this does not mean that the book is without interest to the English agriculturist. The exhaustive examination made of root systems and the moisture conditions prevailing in the subsoil under various modes of cultivation gives the book high scientific worth.

The absence of rainfall does not necessarily mean a lack of moisture in the soil, and conversely, rainfall may not be accompanied by sufficiency of moisture to sustain plant life. The more or less moist condition of the upper earth is mainly dependent on the amount of water precipitated in the form of dew, rain, etc., and the amount used up by roots. Rotmistroff shows the best methods of *Verhütung* to be the economising of the moisture in the earth and the full utilisation of all forms of precipitation.

British Floods and Droughts. C. E. P. Brooks, D.Sc., and J. Glasspoole, M.Sc., Ph.D. Ernest Benn. 10s. 6d.

Though not in any special way written for agriculturists, there is much in this new work of Dr. Brooks and Dr. Glasspoole that should be of use to them. A chapter on cycles of weather discusses in detail all that is known of periodicities and recurrences, and although it is not claimed by the authors that completely reliable weather forecasts can be based on periodic phenomena, it is of interest that in a comparison of two weather curves, covering the period 1870-1930—one calculated from seven periodicites and the other reproducing the observed rainfall—the troughs representing the drought year 1921 practically coincide.

The causes of drought are closely examined, and the important fact emerges that, whilst English rainy seasons are influenced by such local factors as the Gulf Stream, the Labrador Current and ice of East Greenland or Iceland, drought appears to be a resultant of more general, worldwide fluctuations, which are related to the general circulation of the atmosphere.

A note is appended which gives a method for the calculation of a year's probable "raininess," based by the authors on their study of English weather from A.D. 9.

Eggs. A Treatise on their Food Value. Gatecliff, Birchington, Kent. 6d.

The public have in recent years, through the Press and by trade advertisements, been educated as to the value of milk and fruit in the national dietary. Up to the present little has been done to put forward, in a popular manner, the great value of eggs. The keen competition among retailers and the inadequate protection at present afforded by the law has permitted the less scrupulous traders to adopt methods of improperly describing their wares. Having in recent years made a special study of his subject, no more qualified advocate for the egg could have been found than Mr. Gatecliff.

A lecture given by Mr. Gatecliff at Preston last August on "The Commercial Egg" is now reprinted in this excellent pamphlet.

Another Beet Sugar Factory in Alberta

AN announcement recently made by the Utah-Idaho Sugar Company indicates that its subsidiary, the Canadian Sugar Factories, Limited, is prepared to build another sugar factory on the Lethbridge Northern Irrigation tract as soon as the farmers in that neighbourhood are able to produce a sufficient quantity of beets to justify its establishment. The Company is prepared to erect plants with a capacity of about 1,000 tons daily, similar to those now working at Raymond, Alberta. To warrant the building of a plant of this size a sugar beet area of between 7,000 and 10,000 acres must be cultivated.

Recent Patents

These particulars of New Patents of interest to readers have been selected from the "Official Journal of Patents," and are published by permission of the Controller of H.M. Stationery Office.

Latest Patent Applications

36323. EWART, R. D.: Machines for extruding butter, etc. December 10.

36529. EGG PATENTS, LIMITED: Preservation of eggs. December 11.

38438. WEIL, L.: Production of baking-powder mixtures. December 31.

333. BROTELLE, O.: Preparation of foods. January 4.

72. ELBE, R.: Apparatus for drying and smoking meat, etc. January 1.

Specifications Published

302,447. JOHNSON, J. Y. (I. G. FARBENINDUSTRIE AKT.-GES.): Preserving perishable goods.

302,628. SALERNI, P. M.: Manufacture of sweetmeats or confections.

303,187. NORTH, DR. C. E.: Manufacture of beverages comprising a mixture of milk and cocoa or a cocoa preparation.

303,241. MURRAY, R. W., AND MURRAY AND COMPANY LIMITED, R. S.: Packing for caramel and like sweetmeats.

303,254. WRIGHT, F. H., AND LEWIS, E. W.: Sausage-filling machines.

Printed copies of the full Published Specifications may be obtained from the Patent Office, 25, Southampton Buildings, London, W.C. 2, at the uniform price of 1s. each.

Abstracts Published

294,087. **Jar closures; condiment receptacles.** SOLBUE, S., 2, Gibraltargatan, Göteborg, Sweden.

294,133. **Yeast.** SAK, S., Gefionsplads, Copenhagen. In a process for the continuous manufacture of seed or commercial yeast, the wort withdrawn from the vats is centrifuged and transferred to a distillation apparatus where it is wholly or in part freed from alcohol and continuously returned to the fermenting wort. Distillation is carried out at a temperature of 70° C. under reduced pressure, and the wort is maintained at this temperature until it is returned to the vats, when it is cooled prior to its flow into the fermenting wort. Specifications 203,300, 205,813, 294,131, and 294,132 are referred to.

294,378. **Milk churn, etc., lids.** NAUCKHOFF, B., Eskilstuna, Sweden.

298,061. **Preserving food.** MOHRENWEISER, C. AND MOHRENWEISER, J. (trading as BERTRAM, C.), 5, Gardelegenerstrasse, Stendal, Germany.

Food materials such as fruits, sausages, hams, eggs, cheese, chocolate, and confectionery are preserved by coating or sprinkling with a base material, to which is added a small amount of a mixture of colophony, sodium benzoate, benzoic acid, salicylic acid, spiræin, and ammonium carbonate. The base material may consist of a glaze-like substance such as paraffin wax, neats'-foot oil, or beef tallow, or of a powdered material such as lime, chalk, dolomite, or talcum. An example of the proportions used is given. The powdered substance may be removed from the food material by washing in cold water and the glaze-like substance by washing in hot water. Reference is made to the Public Health (Preservatives, etc. in Food) Regulations, 1925-27.

298,449. **Moulding sweets.** SMITH, J. W., PRIOR, J., AND ALUMINIUM PLANT AND VESSEL COMPANY, LIMITED, Point Pleasant, Wandsworth, London.

298,501. **Extracting sugar.** NOBEL, N., 9, Kenaupark, Haarlem, Holland.

298,661. **Confectionery.** SMITH, J. K., Hawkhill Bakeries, Lockend Road, Leith, Midlothian.

A work table for use in the manufacture of confectionery comprises a circular platform with a centrally disposed receptacle for cream or the like, preferably sunk into the table. The table is mounted on a framework, having a central shaft and a peripheral pulley whereby the frame, table and receptacle are rotated from a power source by a belt. The apparatus works in conjunction with a machine for slitting or partially incising pastries, the slit pastries being delivered from the machine on to the table, which carries them to the operative, who receives and fills them in turn.

298,672. **Dividing dough.** KREMMLING, O., Hamersleben, near Oschersleben, Germany.

298,681. **Packing.** HARTMAN, C. W., Lyngby, near Copenhagen.

Filling powder, dust, etc., into boxes or cartons.—A machine for filling powders, dust, etc., into cartons or boxes comprises a bowl-shaped stand supporting a vertical shaft, about which rotates a boss formed with cylindrical walls; the walls carry hoppers communicating with accurate concentric gutters, fed, through pipes, with weighed quantities of materials, the gutters inclining downwards towards pipes which extend downwards from them to the hoppers. More than one gutter may be formed on one circumference, each gutter having its own delivery pipe and hopper. The hoppers slide vertically under control of a cam

surface on the bowl so that they are lifted from filled cartons and lowered into empty ones. To exclude dirt, etc., from the machine, the wall fits into a groove beneath a cover plate fixed to the shaft.

298,700. **Treating cereals.** HALL, J. A., 66, Goldington Avenue, Bedford, and GEORGE, W. F. C., Wilby, Wellingborough, Northamptonshire.

Treating with air; treatment by steaming.—Wheat or other gluten containing cereal is subjected for a period of from four to ten hours to the action of hot air circulated by a fan through the grain and a heater and returned through the grain, the air entering the grain at a temperature of from 212° F. to 240° F. Steam is injected into the hot air before it enters the chamber containing the grain in sufficient quantity to cause the air to be saturated if cooled to 140° F. After treatment the grain may be cooled or it may be run direct into bins. The treated grain is ground and mixed with ordinary flour in the proportion of ¼ per cent. to 3 per cent.

298,735. **Cooling sugar.** WHITE, A. E., 88, Chancery Lane, London. (Ackers, Lonsdale, and Company, Proprietary, Ltd., and Lonsdale, G.; Parramatta Road, Petersham, Sydney, Australia.)

299,043. **Beverages.** SCHICHT ATK.-GES., G., Aussig-on-Elbe, Czecho-Slovakia.

Fruit juices; sterilising liquids.—Fruit juice is sterilised and clarified by passage through sterilising filters before concentration by evaporation at a low temperature in a high vacuum, to obtain a syrup which retains the colour, taste, and vitamins of the original juice.

299,061. **Treating palm fruit.** RUBBER CULTUUR MAATSCHAPPIJ AMSTERDAM, 364, Heerengracht, Amsterdam.

Husking and decorticating, treating with air and gases.—Palm fruit, after being subjected to a low pressure for obtaining palm oil, is passed through a drying drum and is separated by an air blast into its constituent nuts and pericarp, either therein or in an adjacent air separator. For example, a current of hot air may be forced or drawn through a drying apparatus rotating on a substantially horizontal axis. The drying and separating may be effected either by flue gases or by air heated, for instance, by waste steam.

299,617. **Milk preparations.** BUNING, H., 30, Kapellenstrasse, Wiesbaden, Germany.

For producing artificially enriched milk and artificial creams, earth nut oil, hardened to 32° C., is added to the milk, the mixture or the oil being homogenised under a pressure of 175 atmospheres for enriched milk, 150 atmospheres for coffee cream, and 50-75 atmospheres for whipped cream. The homogenisation of the mixture is effected in a homogenising machine, and that of the oil alone by injecting it into the milk under the specified pressure, preferably through a nozzle having an orifice of 0·5 mm. diameter. In producing the cream capable of being whipped, after the homogenisation stage the mass is put through a centrifugal machine and the artificial cream thus separated is then pasteurised, or 35 parts of fat may be injected into 65 parts of milk at a pressure of 50-75 atmospheres. In making the artificial coffee cream pasteurised milk is used. Seasame oil may be mixed with the earth nut oil, and the mixture hardened to a temperature of 32° C. Specifications 2020/05, 125,172, 128,544, and 195,343 are referred to.

300,261. **Puffed food preparations.** KELLOGG COMPANY, Battle Creek, Michigan, U.S.A.

Cereals, seeds, nuts, fruit, vegetable, or other plant material in the form of grains, kernels, or other unit masses are subjected to an external force sufficient to modify the internal structure of the unit to facilitate the material swelling, puffing, popping, or otherwise increasing in volume. A cereal grain may be cooked with water, preferably under steam pressure, with or without the addition of flavouring material. The grain is dried and the kernels separated. The pressure is then applied by passing the kernels between revolving rolls spaced to press the kernels slightly. The compressed kernels are further dried, and then caused to swell by heating in a revolving cylinder, oven corn copper, or similar device. The units may be formed by a preliminary treatment such as cutting, slicing, pressing, comminuting, shredding, extruding, or combining into larger aggregates. In place of rolling, any other means of pressure may be applied. Two or more component materials may be combined to form the units for treatment. The swelling process may be omitted.

Recent Trade Marks

This list of Trade Marks of interest to readers has been selected from the "Official Trade Marks Journal," and is published by permission of the Controller of H.M. Stationery Office.

VITAMWEAT

491,967. **Wheat products for use as food.** PEEK FREAN AND COMPANY, LIMITED. 158, Drummond Road, London, S.E. 16. January 9.

VITA-MUSTARD

492,738. **Mustard as an ingredient in food.** GEORGE HOLT THOMAS, 24, Portland Place, London, W. 1. January 2.

PROVITA

496,159. **Cocoa, chocolate, chocolate confectionery and a powder containing cocoa or chocolate for use in the preparation of a beverage.** ROWNTREE AND COMPANY, LIMITED, The Cocoa Works, Wigginton Road, York. January 2.

FRIFRIFT

496,170. **Frying fats.** SQUIRRELL AND CLEVELAND, LIMITED, 16, Museum Street, and 15, Black Horse Lane, Ipswich. January 9.